Travels In British Guiana.

Richard Schomburgk,
1840-1844.

DAMUS PETIMUSQUE VICISSIM

Volume II.

Translated
By
Walter E. Roth.

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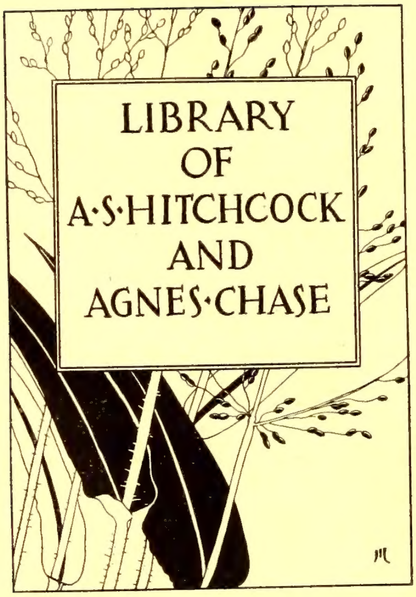

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RICHARD
SCHOMBURGK'S
TRAVELS IN BRITISH GUIANA
1840-1844.

Translated and Edited, with Geographical and General Indices, and Route Maps.

BY

WALTER E. ROTH.

Formerly, Commissioner of the Rupununi and Pomeroon Districts, British Guiana:
Chief Protector of Aboriginals, Queensland: Royal Commissioner to enquire
into the condition of the Natives of Western Australia, etc.

VOL. II.

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1923.

TRAVELS IN BRITISH GUIANA

DURING THE YEARS 1840—1844.

Carried out under the Commission of
HIS MAJESTY THE KING OF PRUSSIA
BY
RICHARD SCHOMBURGK.

Together with a Fauna and Flora of Guiana according to the works of Johannes Müller, Ehrenberg, Erichson, Klotzsch, Troschel, Cabanis and others.

Including Illustrations and a Map of British Guiana
DRAWN UP BY
SIR ROBERT SCHOMBURGK.

VOLUME TWO.

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At the Publishing House of J. J. WEBER.
1848.

PREFACE TO THE SECOND VOLUME.

The friendly reception accorded the first volume of my Travels, a labour that entailed sacrifices and troubles of every description, necessitates the expression of my sincere thanks to the honourable subscribers.

Besides that, I feel forced to protect my publisher from the reproach that might be levelled at him by the subscribers for the original plan of the work having been exceeded, and the cost thereby increased.

While fully and gratefully recognising the conspicuous merit which several of our most famous learned men are deserving of in connection with the technical portion of my book, I venture to submit that its enlargement consequent on the thoroughness of their scientific investigations is quite as much in the interests of knowledge as in those of the subscribers themselves.

At the same time, it is my bounden duty to take upon myself the entire responsibility of having enlarged the original scope of the work, as well as to guard and absolve my publisher from every misunderstanding: with the most unselfish readiness, he has paid every conceivable attention to the general get-up of the volume.

For the reasons above given, it was found impossible to find space in the second volume for that important portion of the work, the Fauna and Flora of Guiana. Furthermore, the forms new to science proved so much more numerous than could possibly have been anticipated that I found myself forced to have this compilation of the Animals and Plants issued in a third and separate volume.

Unfortunately, under these circumstances the Publisher, if only on the chance of covering the considerable cost of the undertaking, cannot help charging a moderate increase in price.

Although the Fauna is already set up in type, and only the Flora still remains, I thought that the issue of the second volume ought not to be postponed until the completion of the whole, which latter the honourable subscribers can count upon being fixed by next Midsummer Day.

RICHARD SCHOMBURGK.

Berlin, March 1848.

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1. Awakening morn, 24th March, 1842, found us all busily engaged: the village itself had become a heap of excited ants; old and young were gathered around our house because it meant good-bye once more to women and children. Though the bundles had been divided up amongst their respective carriers the night before, there was still a lot to be done in altering the packs before the broad forehead bands could be fixed in position. The Indian rarely carries a load on his shoulders, but almost always with the help of the neck muscles. A broad band of bast with the ends tied on to the two main-sticks of the pannier (Rute), is of just such a length to allow of the load, resting on the back, being carried by the head, while the middle of the supporting band pulls on the forehead, instead of two bands dragging on the shoulders as with us. Already by yesterday afternoon, the village showed up more lively than usual, because in addition to the solid substitute for Paiwari which, like our soup-tablets, had to be taken on the journey, each woman had to prepare a number of delicacies etc. for her husband, to fill his rouge-pot afresh, in short to look after all the little trifles required on an Indian excursion, and get everything packed in a water-tight little basket (Pacara) plaited out of *Calathea*. If the trip lasts several days the ever-present Paiwari is also necessary: to do without his favourite drink for longer than 24 hours would be a demand to which the native would only submit with a growl. A few days before the house-master has to leave, his wife bakes some fresh cassava bread; a portion of this is chewed, while the remainder is kneaded with the chewed mass and thickened manihot juice into a dough which is carefully preserved and taken on the road. After four or five days, the fermentation process has already taken place. When the Indian wants to quench his ever active thirst, he takes a small quantity of the mess, puts it into a calabash, pours water on it and now stirs away until such time as it is all dissolved.

This substitute will keep at the very most for certainly fourteen days, but by the end of that time it will have developed into a play-ground for innumerable maggots. The thirsty soul accordingly takes care that no such devolution shall take place..

2. But the real travelling gear consists of the beloved hammock, the hunting bag mostly made of jaguar skin, bow, arrows, some fish-hooks, the filled rouge-pot, glass and comb, the calabash, a small bundle of tobacco leaves and some strips of the paper-like bast of *Lecythis ollaria* Linn. in which he rolls his tobacco to smoke like a cigarette.

3. Although we knew that whenever he undertakes a journey of several weeks' duration the Indian never leaves his wife at home, equally from motives of jealousy, as for his own innate comfort, to which she has to minister sufficiency in every respect, we had nevertheless made it distinctly understood, when hiring the carriers and guides that, with the exception of Sororeng and Aiyukante, a Macusi who had been with my brother on a previous journey and as a mighty Piai was held in considerable repute among the whole of the tribe, no one was to take his wife and children with him. Our object was not to increase our party, already numerous enough without these dependents.

4. When Aiyukante, accompanied by his daughter and Baru, his second wife-to-be, a pretty long-haired girl ten years of age who cherished a deep-rooted objection to her future lord and master, appeared in front of our house, he was nevertheless followed by some few Indians also with wives and children, ready equipped with bag and baggage for the trip. If we really wanted to start, we would have to make the best of a bad job: to call these dependents back would mean the men following suit. The poor creatures were loaded up not only with all their cooking utensils, hammocks, etc., but also with large quantities of cassava meal, although it was we who had to board them on the journey—because abstinence from fresh cassava bread for longer than a couple of days is yet another of an Indian palate's minor sorrows. The cassava meal is tightly packed in spacious plaited baskets which are previously lined with palm-leaves and at every camp so much taken out as will suffice for some fresh bread for the husband, it being baked either on a stone or equally as well in one of their empty pots. As the master, mistress and children left their house, they were naturally followed by the whole crowd of dogs that, with their insensate barking, were already intoning a Jubilee hymn on the journey in store, when fortunately the wishes of their owners ran counter to their own, a fact of which they were soon to be convinced by many a sound thrashing and repeated showers of stones.

5. After we had finally said good-bye to Mr. Youd, and the officers who had come over from the fort, our party of forty-nine persons made a move in Indian file, the women forming the rear-guard. The road through the savannah, tending to the westward, brought us after half-an-hour's plenty of winding to the banks of the Pirara River, where it overflowed from Lake Amucu. The former, however, was so dry that we could wade through it without any trouble. The pretty clusters of *Helicteres guazumaefolia* shrub with their scarlet-red floral decorations

that grow in isolated places here in the neighbourhood of the Pirara soon lay behind us. With the crossing of this river the rolling ground stretching towards the south completely disappeared.. Our course was a northwesterly one. The change in surface formation was accompanied with an alteration in soil. The clay that generally constitutes the substratum lost its red colouring, while those rounded shiny bits of quartz and clay, stained red-brown with oxide of iron, that had covered the undulating savannah for miles and miles, were no longer visible. The ant-hills were also entirely wanting in the plain. As the whole of this stretch lies something like a hundred feet below Pirara Village it forms a lake, Lake Amucu or Parima,* during the rainy season. In its vegetation this flat corresponded entirely with what was already known to me, except that the predominating *Byrsonima verbascifolia* covering the savannah in all directions with its silvery felt-like leaves and yellow blossoms at least caused a break in the general uniformity: the latter, at all events, had reached their culminating point, owing to the dry season now coming to an end. *Cyperaceae* such as *Cyperus amentaceus* Rudge, *Isolepis junciformis* Humb. Bonp., *I. capillaris* Roem. et Schult., *Hypolytrum pungens* Vahl., *Chlorideae* and *Festucaceae*, in between which one nevertheless found plenty *Eriocauloneae*, formed the usual herbage-covering. Among the latter the *Paepalanthus capillaceus* has a specially peculiar interest in that the Indian by burning off the savannah apparently helps it to blossom. When the fire destroys all the leaves the innumerable sweet-scented knob-like buds start developing within the next two or three days from out of the thick, short, leafless, blackened stalks: if the flowering season is over, then the leaves alone appear. I have only in exceptionally rare cases found specimens which, escaping the fire, possessed leaves and blossoms at one and the same time. A species of grass, though I never saw it in flower, often covered entire areas to the exclusion of others, and was specially interesting on account of its name: the Macusi called it vannah and such flats vandai. Whether the term Savannah might be derived from this word, I must of course leave to etymologists to decide.† The ground was so cracked with the intense heat that it was covered with a regular network of clefts over three to four inches wide.

6. Our journey would have proved extremely monotonous to-day had it not been lightened by the Canuku and Pacaraima Ranges in the south and north respectively, combined with the innumerable blue blossoms of *Eichhornia azurea* and *Heteranthera limosa* Vahl. that had gathered near the now almost waterless Lake Venturu and the large flocks of duck which on our near approach rose from it with a piping cry. That the *Anas viduata* and *brasiliensis* had to supply a numerous contingent for our next meal, it is unnecessary for me to say. Besides these, an occasional Cara-Cara eagle or two went careering around the dried-up swampy ground, while small companies of *Ibis albicollis* Vieill. enlivened the

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* According to Sanson's map of 1656, Parime is the name given it by the Carib, but Roponowini by the Iaoyi (Ed.)

† The word is derived from (the Spanish) Sabana, a cloth or large sheet (Ed.)

dreary plain. On scaring the latter they let out their peculiar loud rolling note. I have noticed these Ibis less often on the edges of swamps than on dried-up swamp-beds, where one usually finds some six to eight of them together. *Mycteria, Ardea, Ciconia* etc., which previously gave life to such scenes had all taken their departure with the disappearing water to the savannah streams.

7. Towards mid-day, under a temperature of 125° F. the effects of the reflected solar rays were soon to be recognized not only in the atmosphere, that seemed to set everything dancing, but also in my own circulation. Occasional cooling currents of air out of which one passed again into sultry hot layers only made the contrast all the more perceptible. Peculiar and apparently new meteorological phenomena for me were the many whirlwinds and consequent wind-spouts which, since the Rupununi savannah, I never saw again in such numbers. Suddenly from out of a spot amongst the dust and bush-leaves, etc., one sees a portion being driven along over the flat in an apparently horizontal direction in a spiral course until, its commencing area continuing to rise, it soon stands up momentarily like a spiral column on the savannah over which it then rushes; at the same time its lower portion becomes more and more transparent, it divides itself midway and disappears without a trace. Apparently the reason for these numerous wind-spouts lies in the inequality of temperature in the atmospheric layers produced by the reflected solar heat, and in the resultant currents of air passing, it is true, in parallel yet in opposed directions. After little Lake Venturu, where the water left remaining was hardly drinkable, we again did another eight or ten miles without quenching our burning thirst, though the 125° F., was by no means the maximum of the day's temperature, which was only reached about three o'clock. The regular Indian file of the morning had long been broken up; if one took a look back, the tired rear-guard followed those in the lead at a wide interval, and many of them were actually beyond the far-reaching horizon.

8. We started out with plenty of cheering, joking and good spirits, but in proportion as the heat increased, the noisy voices became gradually hushed. Wherever a miserable *Curatella* threw its shadow, one noticed one or other of the exhausted negroes and Germans hurrying to rest in its pale shade. The Indians, however, even under their loads, were not given to such weakness: they briskly forged ahead along the narrow path and met all specific questions as to how far it still was to Pirara mouth, the day's objective, with an adroitly turned countenance and the reply, "A-minki, A-minki, Matti (Very far, very far, friend)," surely not much comfort for people dead-tired and half-perishing with thirst. Finally there appeared on the horizon a row of trees in vibratory motion—it was the timbered banks of the Pirara. Every bit of strength not yet wasted was hastily gathered to make an end of the intolerable conditions, and rest our exhausted limbs in the dusky shadows. The longed-for Eldorado was not reached until four o'clock when we were at last able to fulfil the one desire we cherished. An hour's rest in the dark shade of the green trees so strengthened our weary limbs that at least the portion of our column

that had steadily kept ahead with the Indians, reached Pirara mouth. Many of those left behind only came in late at night, while the remainder, and this was the greater number of negroes and Germans, only arrived on the following morning. We had done seventeen miles which, under a temperature of 125—130° F. and over a savannah without any shelter, was far from being so insignificant as it might seem.

9. The widely spreading branches and densely-foliaged top of a large Mararen tree (*Copaifera Jacquini* Desf.) which stood at a short distance from Pirara mouth, but quite close to its bank, and on the monstrous trunk of which the numerous scars, old and new, showed how often its gum had been taken possession of, while the ground cleared of all undergrowth indicated how generally it must have been used for a landing stage—likewise promised us the wished-for shelter, and we immediately picked it for our camp.

10. While Pirara was in possession of the Brazilians, there was active communication between them and the people on the Rio Branco and Fort Sao Joaquim: this was interrupted only during the dry season owing to the want of water in the Pirara, because at this time of the year the folk on the Rio Branco cannot bring their big corials further than here.

11. To collect Mararen balsam the Indians hack a deep cut halfway round the lower portion of the trunk, till it reaches down to the core. In certain months, particularly February and March, the resinous sap flows out in quantity and fills the cavity out of which it is drained from time to time. We also found the cuts filled, and innumerable wasps and flies collected around. Could the former, perhaps, be using the balsam as a binding-material for their nests? Except for wounds and for anointing the body and hair, the Indians do not use the balsam for anything further, because all those devastating diseases in the healing of which it was previously generally employed are still foreign to them: they only collect it at the present time because it has become known as an article of barter that is enquired for and easily obtained. In the immediate vicinity of our camp several *Tontelia* trees equally interested me from the very first on account of the rich colouring of their flowers. On subsequent investigation they turned out to be new species, and *Tontelia guianensis* Klotzsch was my first find on the Pirara.. The opposite bank of the river rose perpendicularly to a height of 20 to 30 feet.

12. Although during the course of the following day two small corials were found by the Indians under the shrub along the riverside, they seemed in such a miserable condition that we would not have trusted even our less valuable baggage in them without previous substantial repairs. These could be effected at our leisure as three days' rest at least were required to see what effect the land transport had exercised on both chronometers, which were kept in a small tin canister, that had been carried by the most reliable of the Germans, one Reiter, by means of a strap over his shoulder. The corials could consequently be repaired by the time we made a fresh start, and as the *Curatella americana* on account of its crooked growth, supplied us with most excellent "knee" timbers, it was without any great trouble that we were able to give the vessels the necessary stability. The uniformly crooked branches of this

tree might be used with considerable advantage for the frames of military saddles: it is generally met with throughout the savannahs and I firmly believe that from those situate between the Rupununi and the Rio Branco, the whole of the European Cavalry could be supplied. The Macusi call the tree Curatakie, for it is particularly with its rough leaves that a polish is given to the casing of their blow-guns (Cura).

13. Though the effect of the transport on the chronometers was shown to be nil, and the corials were repaired, we were nevertheless detained at camp through an unfortunate accident. Owing to their ripe fruit the very many Cucurit (*Maximilia regia*) and Sawari palms hemming in the banks proved a favourite resort for innumerable blue Araras. On the morning after our arrival I had shot several, with which Hamlet had made a most delicious soup. Stöckle and Petri, the fourth German, having tasted the latter and finding plenty of good cause to prepare a similar dish for themselves, both started off at once to get the necessary ingredients.

14. They had not long disappeared among the trees when a shot followed by a yell piercing our very marrow bones, set the whole camp in commotion. All rushed to the spot where we found Petri on the ground rolling in blood, and Stöckle, wringing and writhing his hands, rushing round him. As we bent down over the poor devil we discovered an extensive gun-shot wound on the lower side of the shoulder-blade. Its situation naturally led us to the conclusion that Stöckle must have been the careless and silly marksman for which we immediately reproached him most bitterly; the latter, however, maintained that he was blameless, that his gun was still loaded, that at the time of the shot he was nowhere near Petri, that he had only come up when he heard the cry for help, and that therefore he (Petri) must have shot himself. It turned out to be so. Petri, wanting to creep through a thicket, had dragged behind him his gun, which, as he assured us later, was uncocked, when the trigger was probably held fast by a creeper, forcibly pulled, and so raised, the result being that the weapon was fired. After carrying him still unconscious to camp where, owing to the wound in the back, it was impossible for him to lie in a hammock, we prepared a staging with sticks thickly covered with grass, and on examining the wound no one believed he would live till morning. The outer wound was the size of a three-penny piece which showed that the shot-laden barrel must have been fired at quite close quarters; the shoulder-blade, however, was smashed to pieces. Mr. Fryer, to whom gunshot wounds were nothing strange, searched for everything in the medicine-chest that might give the sufferer relief of any description. The greatest torment of all, however,—the frightful heat—unfortunately could not be alleviated, for in spite of the thermometer being under the tent, and this again shaded by the Mararen tree, it yet recorded about three o'clock in the afternoon 97° to 100° F.: its lowest reading at six in the morning was 73°. Notwithstanding the continuously repeated douching, maggots had already developed in the wound three days later, and the stench was almost unbearable. As the patient fortunately with-

stood the traumatic fever, Mr. Fryer expressed the hope that the poor fellow might still be saved.

15. It being impossible for us to remain here, and the sick man unable to follow us, a messenger was despatched to Mr. Youd on the morning after the accident asking him to send eight Indians along to carry the unfortunate fellow over to Pirara. Mr. Fryer and Tiedge would accompany him, and remain until their mutual help was no longer required. Petri, however, was not for long the only wounded patient. For keeping us in health during the insufferable heat the cooling waters of the Pirara proved a very great blessing which unfortunately however only too soon drove us to despair because one of our Indian boy-followers, while swimming across the river, had a big bit of flesh bitten out of his foot by a ravenous Pirai (*Pygocentrus*): his awful screams, on receiving the wound, made us at first fear that he had become the prey of a kaiman. Fright and pain had given him such a shock that he could barely reach the shore. Considering the immense quantities of these terrible predatory fish which the Pirara contains, and numbers of times we had bathed, it was very lucky that no more of us had been bitten already. As there was no pleasure in risking one's body amongst these villains, bathing was naturally stopped, though it was hard to make the resolution. The firm conviction that our expedition must meet with an unfortunate conclusion was henceforth the established belief of all the superstitious folk, from Indians to Stöckle inclusive.

16. After what had hitherto been the watering-place, the juicy and pleasantly sourish fruits of a Eugenia (*Eugenia cauliflora* De C.?) which had quite the size and shape of a greengage, and were of a brown-red colour, supplied us with an uncommonly refreshing drink, in the preparation of which the Indians were our teachers: they called the fruit Casami. We found this species here for the first time: in the course of our journey it was present in considerable quantity the whole way up the Takutu, where it appeared most plentifully in between the rock-fragments that cross the river so plentifully.

17.. The Mahu, rolling along with its coffee-brown waters between the thickly hedged-in banks, was far more extensive than I imagined. Its sources are on the northern slope of the Pacaraima Ranges, upon a tableland over which it soon forms an imposing waterfall, called the Carona, to continue its course along the picturesque, although barren valleys of the range. During the rainy season this river particularly contributes in large measure to the flooding of the savannah when at the same time the peculiar phenomenon comes to light that the waters of two streams of absolutely different river systems join with one another.

18. As a result of the present low water level in the Pirara near its mouth, the brown surfaces of a number of larger and smaller boulders of a coarse-grained quartz conglomerate, cemented with a ferruginous clay became exposed and in isolated spots formed regular banks. Such situations appeared to be the most favoured by the Eugenia mentioned above, because one did not meet the former without the latter. Though

the flora in the environs showed no great variation* the little strawberry-tasting fruit of the small *Psidium turbiniflorum* Mart., called Piriko by the Indians, as well as that of the Eugenia, gave us a cordial that was much sought after. The fruit of another species was of almost the same size as *Psidium pomiferum*: its bushes are three to four feet high,—the Indians called this one Cunang. Although we managed to collect so much of the fruit, we only succeeded in finding one blossom to allow of our identifying these two interesting species.

19. As there was nothing for the Indians to do in the enforced interval they daily followed their love of hunting, and never returned home without a rich harvest in deer, large birds, like *Mycteria*, the Glutton (Sawiwi of the Macusi) and ducks. One of the *Mycteria* with its wings outstretched measured 7 feet 2 inches. When the bird is still young, its flesh is very like beef, and Hamlet prepared such excellent cuts from the breast that they could hardly be distinguished from "beef-steaks," but with older birds other chewing organs and muscles than ours were certainly necessary for masticating it. The thick bush at the riverside re-echoed every morning and evening with the lovely yet mournful song of the beautiful trupial which I saw here for the first time in a wild state. It is only found within the hemmed-in brushwood of the banks of the savannah streams, and according to the statement of the Indians most frequently on the Mahu, Pirara and Takutu. It hangs its bag-like nest, which is built of the finest blades of grass, on arborescent bushes that grow on the edge of the savannah. In Georgetown it is generally valued for its lovely note, and is eagerly bought by the colonists from the Indians who bring it down only to die prematurely on account of its apparent inability to endure close confinement. Although I found this bird tame in almost every settlement on the journey, it nevertheless had perfect freedom to fly wherever it liked. In Georgetown, the average price for a trupial, as the colonists term it, is five dollars. Our Macusis call it Murumuruta, and the Brazilians, the Guiana Nightingale. Another light brown bird which I also found here for the first time was the *Furnarius leucopus* Sw.: it also lives in the brushwood on the banks of the savannah streams. Shortly before sunrise and sunset its clear piping voice re-echoed throughout the scrub, for which reason it served from now onwards as the Reveille for break of day and commencement of work. The garrulous "Q'est-ce-que-dit" was just as plentiful. This genus, with its so numerous species, seems to be spread over the whole of Guiana; the Macusis call it Sette-qui. The pirais in the Pirara were just as abundant as the electric eels which were caught in quantities on the hook: as soon as one of the latter took the bait, it was immediately felt by the shock, on account of the instantaneous electrical discharge, that gave rise to many a comic scene.

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*—*Licania incana* Aubl., *Helicteres guazumaefolia*, *Sida linifolia* Cav., *Pavonia speciosa* Humb. Kunth., *P. cancellata* Cav., *Melochia fasciculata* Benth., *M. melissaefolia* Benth., *Tibouchina aspera*, *Mimosa camporum* Benth., *Neptunia polyphylla* Benth., *Rhyncanthera acuminata* Benth., *Miconia fallax* DeC.

20. A week after the unfortunate accident the eight Indians that we had asked for arrived, and as the traumatic fever had run its course, Mr. Fryer thought that he, with the patient, could undertake the journey to Pirara. Mr. Youd's letter to my brother of course regarded the misadventure as the direct punishment of Heaven for breaking the third Commandment: because it was a Sunday on which Petri had gone out hunting with Stöckle, and I also. It was on the 2nd of April that Mr. Fryer and the sufferer, for whom a comfortable stretcher had been prepared, left our camp in company with Tiedge and Hamlet, who had suddenly fallen sick. From the time that our little Indian Cumeru got bitten, everybody could foresee that Hamlet would be ill, extremely ill, on the day that poor Petri was to leave. The latter's bad luck had stimulated Hamlet's superstition, confirmed by Cumeru's mishap with the pirai, that the evil spirits were resolved upon our destruction and that it would be madness to defy the warning voice that had spoken loudly enough. When he found that my brother, inspired by criminal obstinacy, was determined upon continuing the journey in spite of the evil omens, he feigned sickness to save himself from the general ruin: however little we were at first inclined to believe in its genuineness we nevertheless finally gave way and let the superstitious rogue return to Pirara in view of the fact that Mr. Fryer had no one to cook for him during his stay there.

21. To avoid the oppressive heat of the day, the party started off at 3 o'clock in the morning. Sympathetically, and deeply moved, we took leave of our poor countryman but gave Hamlet an awful fright by suddenly calling him back; no longer able to hide his joy he was just then following the stretcher beaming with smiles. Its effect upon the scamp was so powerful that anxiety sweated out of every pore, and there at the very spot we had checked him he remained for several minutes shivering and speechless, until we again at length gave him permission to desert us.

22. We also struck camp on the same day. The two small corials manned by two paddles lodged the instruments, a portion of the baggage as well as poor Cumeru, who was at yet unable to use his foot and could not by any means be prevailed upon to return to Pirara.

23. The thermometrical observations taken at the mouth, during our stay between 27th March and the 2nd April, 1842, gave the following mean results:—

THERMOMETER FAHRENHEIT.

6 a.m.	9 a.m.	12 noon.	3 p.m.	6 p.m.	Max.	Min.
75.72	83.13	91.82	94.92	86.07	98	73

According to both chronometers the geographical longitude of Pirara village was 15′ 30″ (in arc) W.

24. After crossing the Pirara and climbing the steep bank opposite with difficulty and trouble, we continued our journey in a south-westerly direction over a monotonously level savannah towards the junction of the Mahu with the Takutu. We had not followed this course long before

we recognized in the South-East innumerable columns of smoke, the sure indications of a savannah fire, and the Indians anxiously urged us to hurry on because the conflagration would probably be rolling up to us. At first we ridiculed their fears that appeared so improbable, but by the next quarter of an hour our smiling countenance had changed into one of the most bitter seriousness. The danger increased with every minute and soon the awful knowledge dawned upon us that we could not escape it. Look in whichever direction we might, we could nowhere discern any darker coloration in the grassy flats, the site of a swamp; we could nowhere distinguish one of the oases.. But we already recognized the column of fire itself that, fanned by an upspringing South-East wind, was rushing headlong towards us, and we distinctly heard the smashing and roaring of the spluttering herbage, when the sharp eyes of the Indians discovered some small rises ahead, that were only sparsely covered with low grass, and thither we hurried blindly, so as to let the unrestrained element rage past. Half a minute later, and a terrible death would have been our lot. With wildly beating hearts we saw the sea of fire that had already encompassed us, rolling up like a gust of wind, the glowing flames scorching our faces and forcing us to turn our backs, and await the awful psychological moment in the resignation of despair. The blazing breath of flame shot up towards me—two glowing arms of fire glided round the bottom of the hill to junction again ahead in a waving mass, at which I stared with an inward shudder, until it gradually withdrew—we were saved! The flames had, it is true, singed the short grass along the hill-side, but had not met sufficient fuel to permit of our horrible fears becoming terrible realities. Whole crowds of greedy birds of prey, like hungry jackals, circled around and alongside the column of fire and gave chase to the half-burnt snakes and lizards that were escaping from the unfettered element. When with the rapidity of lightning they swooped down on the prey descried, and for a moment disappeared among the wreaths of smoke, it looked as though they wanted to immolate themselves in fire.

25. The deafening noise soon subsided, while the black clouds still indicated the devastating course the fire was taking: as the South-East wind that was still blowing covered us with the light ashes over which we were now treading we soon became regular chimney-sweeps. That the Indians possessed infinitely more stoical equanimity than we did, was again demonstrated here: while the terror of the suspense still weighed upon us like an oppressive nightmare for a considerable time afterwards, they were already on the road with smiling countenances and continuous witticisms over the change which the ashes had made in our appearance. And yet at every step the torment of thirst increased and with every breath the mucous membrane of the mouth and nose became completely covered with the fine charcoal-dust.

26. After more than an hour-long trip, we finally saw a thickly wooded fringe starting up ahead, to which the siren voice of the waters of the Mahu was soon joined. With double-quick stride we hastened on, to moisten our dried-up mouths, to quench our scorching thirst, and free our bodies from the unpleasant ashy-dust that covered them. The yearn-

ed-for objective was soon reached, but our agony was in no sense relieved, for here we stood deluded upon the 25 to 30 ft. high precipitous banks and gazed down on the bewitchingly smiling water, without being able to reach it. After following the stream for something like half-an-hour we at last found a spot where with the help of some tree-roots growing close to the bank there was a chance of overcoming the difficulty that had hitherto been tantalizing us. Regardless of danger everybody tried to satisfy his maddened greed as quickly as possible, and we were soon refreshing ourselves with the clear coffee-brown water. Strengthened and revived we endeavoured to climb the bank which was certainly infinitely more difficult than coming down it.

27. The goal of to-day's journey, the mouth of the Mahu, still lay before us, and we swiftly sped along. Several swampy places, that we had to wade through, were thickly covered with the glorious *Mauritia* burdened with their huge often 5 to 6 feet long fruit-tufts. Although the fruits, dropping here and there as they become ripe, are greedily eaten not only by Indians but by several quadrupeds, the *Psittacus makavuanna* Linn. must be extra fond of them, because we rarely met a group of these palms on which numerous flocks of these brilliant birds were not settled, they being very generally accustomed to nest in the holes bored in the trunks by the woodpeckers. At every group of palms we reached, the deep silence, which is especially noticeable in the tropics at midday when most of the animals remain quiet in the shadows, was broken by a peculiar rolling sound, that spread as a warning note on all sides, when the numerous swarms would rise, and screaming and shrieking fly round the trees. The green colour of the feathers only rarely betrayed the parrots to the eye searching for them among the similarly tinted palm-fronds. Besides noisy birds, a second but silent resident of the *Mauritia* is to be seen here, the *Vanilla palmarum* Lindl. It is strange that this orchid is present on no other palm except the *Mauritia*. It always roots on the base of the leaf stalks, between which some humus collects, while its tendrils hang down the smooth grey trunk. Now and again I found it also on granite boulders where it grows in the crevices filled with earth.

28. Towards 4 o'clock we reached our destination, the junction of the Mahu with the Takutu. Like other savannah rivers, their banks are clothed with a thick vegetation, for which reason their immediate surroundings contrast so forcibly with the more sterile plains. This forest fringe that took us half-an-hour to cross before reaching the river itself, consisted partly of lofty trees, partly of a dense arboreal brushwood stretching from the banks right down to the water-edge over which it hung to shade the water quietly gliding along. Up above, this scrub wood was so thick that it only here and there let a passionate solar ray kiss its mother Earth. The larger trees belonged mostly to the *Cordiaceae*, *Malpighiaceae*, and *Mimosae*. The first genus was represented chiefly by *Cordia tetraphylla* Aubl. that interesting tree which the Colonists, on account of its broad flat depressed top, call the "Table tree" As the limbs all branch off at a right angle, the tree at a distance has really quite the appearance of a huge round table. Just as the *Psittacus maka-*

vuanna chooses the Mauritia for its breeding place, so do the *Cassicus persicus* and *C. cristatus* particularly prefer the isolated standing Cordia from which to hang their purse-shaped nests, that naturally assist in making the tree look still more extraordinary than it already is.

29. Just as plentiful as the *Cordia tetraphylla* was an arborescent *Malpighia* the ripe orange-coloured berries of which covered the whole ground, where they were eagerly gathered by our Indians; by no manner of means could we discover the "sweet-tooth" they found in them. More beautiful in its form and branch-structure however seemed to me a *Mimosa* with bright grey trunk and fine feathery vivid green leaves. Unfortunately we found no blossoms on either of these very interesting trees.

30. A somewhat cleaner spot on the left bank of the Mahu offered us a convenient camping ground. It was some hours after our arrival that both boats put in an appearance. As the Mahu had coffee-brown water, and the Takutu a greenish-blue one—which again reminded me very forcibly of the pleasant waters of my native Rhine, except that the eye searched in vain for the proud battlements of the old feudal castles and simply found an immense yellow plain—so here also, as in the case of the Essequibo and the Rupununi, the dividing line of the waters of both streams only disappeared after a long stretch. At the junction of their two sides, the breadth of the Mahu amounted to 263 yards, and that of the Takutu to 192, which might easily lead us to assume that the latter is a tributary of the former. The Wapisianas and Atorais, who occupy its basin, call it Butu-auuru: our Macusis called the Mahu Ireng. As the geographical latitude of the junction of both streams had not yet been determined, it was necessary to remain here until the sky should permit of taking astronomical observations. Owing to this delay my love for the chase found plenty of scope on account of the numerous *Psittacini* that were met with. The Cucurit and Sawari palms sheltered the blue macaws, the Malpighia laden with ripe fruit had its lovely sun-parrots (*Psittacus solstitialis* Linn., Kessi-Kessi of the Indians), which I also saw here for the first time, while the broad forest belt proved a favourite resort of the beautiful Hokko-hen (*Crax tomentosa* Spix, *Ourax erythrorhynchus* Sw., Pauituima of the Indians). As the glorious metallic-lustred bird is found only in the forested banks of the savannah streams the Colonists call it the Savannah Powis.

31. According to the circum-meridian altitude of the Southern Cross, the mouth of the Mahu is situate in 3° 35′ 8″ lat. N.. This beautiful constellation is generally regarded by the Indians as the abode of the Spirit of the Savannah, just as they also wanted us to believe that the moment it reaches the zenith, the fact is notified to them by the deep wailing note of the Pauituimas. We had always disavowedly laughed at this assurance. For although the statement had once previously been really confirmed, and the Cross happened to have reached its zenith at the very time that the bird usually sounds its hollow melancholy note, namely, at 4 o'clock in the morning, we could not in this one particular case be quite satisfied with its corroboration. But on the 4th April, the *alpha* of the Cross had just reached its meridian at 25 minutes past 11 at

night when at the same moment the hollow note of the Pauituimas sounded through the stilly air: in the course of a quarter of an hour, quiet reigned around our environs. As we had never heard the bird at such an hour of night, the statement appeared so vivid and striking in this instance that all doubts as to the extraordinary fact were dispelled.*

32. The sky, during our stay at the junction, was for the most part clouded, and this, coupled with the fresh east wind, contributed a good deal in mitigating the heat to which we were certainly much exposed owing to a 2,600 ft. long sandbank in the immediate neighbourhood of the camp. Already by the evening of our arrival my attention was several times drawn to the number of large dolphins emerging above the water. Not rarely from six to eight appeared in pairs skimming around on the surface as quick as arrows, or else constantly bobbing up and down, when they would not only raise their pointed snouts out of the water, but mostly a large portion of their seven to eight foot long body. With uplifted heads and a loud noise that much resembled the snorting of a horse they expelled through the spout-holes in the form of fine drizzling rain the water they had gulped into their muzzles: it lent unusual charm to the quiet landscape. I never noticed this particular species expelling water in spouts as is the case with the others. Unfortunately we had no harpoon to secure one of these interesting creatures, and all the many attempts at killing them by bullet proved unavailing. Except in the Takutu and the Zuruma I have never found them in any other Guiana river: they do not even seem to travel up the Mahu. According to the characters observable during their transitory appearance, they must be *Delphinus amazonicus* Mart., which could easily have found their way through the Rio Negro, Rio Branco and the Takutu. They appeared to be especially numerous during the rainy season and immediately after, when the raised mass of water still covered the rapids. They must be particularly fond of the lake-like spots where the two rivers joined; at least, this is what we believed ourselves entitled to conclude considering the large number met in the neighbourhood of the junction of the Zuruma and Virua with the Takutu. Above the connection of the Mahu, they had entirely disappeared.

33. On one of our trips to the opposite side of the Takutu, the sharp-discerning eyes of an Indian had found a corial hidden among the bushes on the bank: by virtue of the elasticity of human conscience our conceptions of Mine and Thine had widened out a bit, and, as a result, it was welcomed as a lucky discovery and substantial repairs undertaken at the spots where damaged. Although the clear waters enticed us so invitingly to bathe, the fear of the piratical pirai made us resist the temptation, no one daring to immerse any portion of his body even for a momentary cooling. That the thieves must have been collected here in

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* Arawaks and Warraus believe that the Southern Cross represents the Powis (*Crax* sp.), the nearer pointer to it being the Indian just about to let fly his arrow, the farther one indicating his companion with a fire-stick running up behind. See Roth's "Animism and Folk-Lore" Etc. (Ed.)

really large numbers was shown by the quantity that the Indians caught on the hook. At the same time, another equally interesting fish frequently took the bait, the *Pimelodus insignis* Jard., a creature that is particularly noticeable owing to its external conformation because the second dorsal fin reaches from the tail to the first dorsal one so that the first pair of float fins are of considerable size. When thrown out of the water, it often survives for more than half an hour outside its own element: its food consists of small fish, its flesh is undoubtedly one of the most dainty morsels, and it is caught up to 18 inches in length.

34. As on the Rupununi, I also found on the sandbank mentioned above, the *Desmanthus* covered with its parasite, the *Loranthus guianensis.* The opposite bank of the Mahu was regularly bordered with lofty trees of the *Mimosa Schomburgkii* Benth., the white florescence of which covered the dark and delicate feathery foliage like a veil. The thermometrical observations, from 3rd to 5th April gave the following results:—

THERMOMETER FAHRENHEIT.

1842	6 a.m.	9 a.m.	12 noon	3 p.m.	6 p.m.	Remarks
3rd to 5th April.	72.50	80.12	89.12	89.43	82.50	A little drizzling rain

35. According to the natural dividing line, the Takutu from its source to the mouth of the Zuruma was regarded as a portion of the southern boundary between British Guiana and Brazil, and the name Victoria Regina with date was therefore cut into a *Mimosa* (Sect. 298), the species of which it was impossible to determine on account of the want of flowers: the Queen was then proclaimed Mistress over the area with every prescribed formality.

36. On the 16th April we resumed our journey: the baggage was for the most part packed in the three corials in which Mr. Goodall and myself also took our places, while my brother and the others proceeded overland along the bank. With his party he crossed the shallow spot in the Takutu about half an hour's distance from our camp which the Brazilians had used as a ford during their connection with Pirara, and those on foot were soon lost to sight: we travelling by corials instead, made but extremely slow progress on account of the low water.

37. In respect to the forest of great lofty trees, the hemming-in of the banks of the Takutu corresponded entirely with that of the Mahu: now and again the bambu (*Guadua latifolia*) replaced the arborescent scrub. Though the corials were at first always confronted with water sufficient for us to pole them along in, this soon failed us in the bulk on account of the numerous sand banks over which we were forced to drag them: for this reason we reached the camp several hours later than those on foot, where to the joy of our hungry stomachs we found the filled-up meat-pots ready emptied into the dishes. The huntsmen had killed a deer and Hamlet's substitute, Adams, likewise a black, had done everything to make us forget his temporary loss.

38. The camp had been pitched on the left bank of the Takutu at the mouth of the small stream Macupara, the name given it by the Macusi after a tree that grows plentifully along its banks.. Judging from the apple-like fruit, it is Aublet's *Macoucou guianensis* (*Ilex Macoucou* Pers.) In the course of the day, we passed the mouth of the Manari, that empties itself into the right bank of the Takutu. At the spots where the Savannah came into direct contact with the bed of the Takutu, the banks consisted mostly of 40 to 50 ft. high perpendicular walls and were generally composed of a ferruginous conglomerate of clay and ground-down quartz fragments, covered with only a two-inch thick layer of mould. The Macusis called these steep banks Iperaghiri.

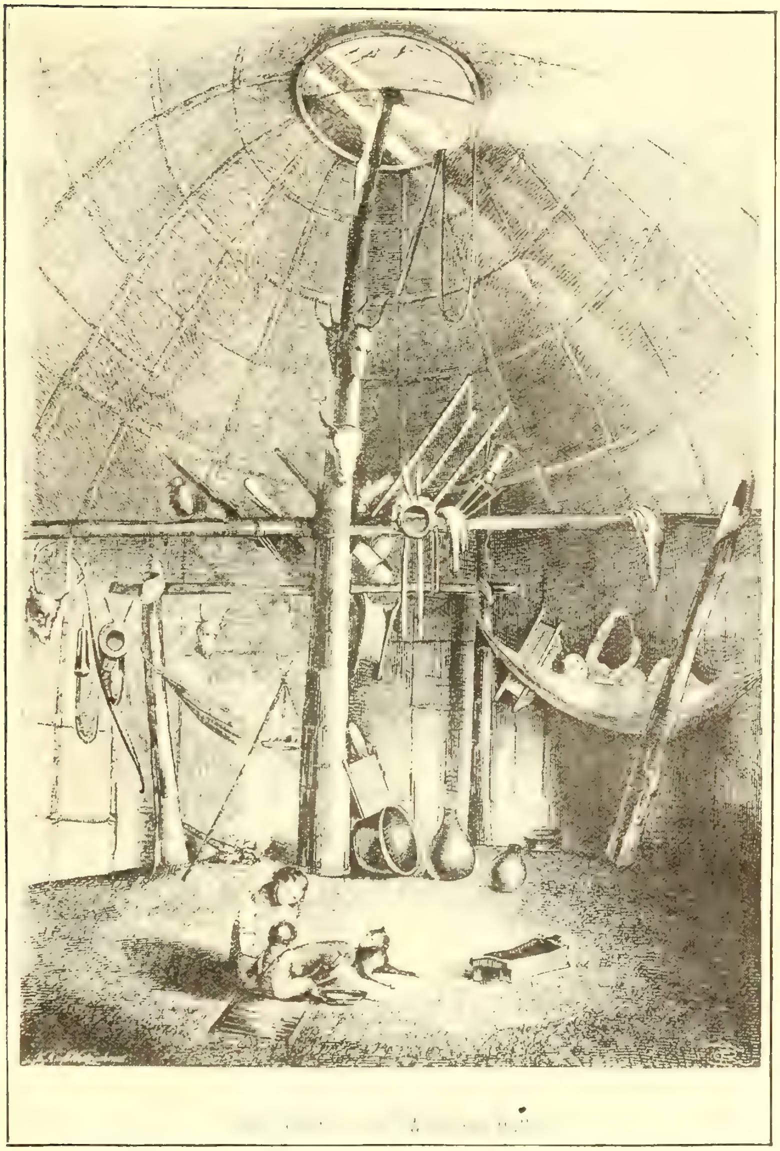
39. Again to-day there presented itself the spectacle, somewhat common of late, of a burning savannah, that every time reminded me of those awful moments when fire threatened me with death—except that the fairy-like play of colours which the setting sun produced on the whirling clouds of smoke developed a new hitherto imperceptible charm in the rushing destructive mass of flame.

40. As the journey on foot was not so well adapted for a view of the river-bed, my brother took his place next morning in one of the corials. After passing a small rapid, that could really only have been noticeable at low water, the vegetation along both banks became always more diverse, always more delightful. The month of April appears to be the commencement of the blossoming season of the interior, whether the rainy season has already set in or not. It has been many times maintained that the vegetation only wants a few days' rain before it begins to carry on anew: the banks of the Takutu however belie this statement in the most forcible manner because March month and the whole of April up to date had passed without almost a drop of rain and yet the river banks were in many places covered with a carpet of flowers. As in my native country, when at this time of year the blackthorn, still without leaves, is covered with snowy blossoms, so also here we came across white masses of flower on leafless bushes of several species of *Erythroxylon*, e.g., *E. rufum* and the new species *E. squarrosum* Klotzsch. Here and there we found among them the large yellow blossoms of the likewise still leafless *Tecoma*, that showed itself partly as tree, partly as arborescent bush, often without leaves, often with them, but invariably flower-bearing: here the dazzling rosy-edged white *Gustavia*, and there the corn-flower blue *Jacaranda* spread their variegated nosegays over the glowing white snow-field. *Mimosae*, *Melastomaceae* and a beautiful *Cuphea* occupied the immediate edges of the banks, but towards the East the dark masses of the highest elevations of the Canuku Ranges such as the Iquari, Zemai, Ramikipang, and Nappi enclosed the horizon as with a wall. In the morning the river-bed was lying apparently in the direction of the South: towards mid-day, however, it turned suddenly towards the East, so that the western portion of the Canuku Range came gradually more into view. It was a lovely picture, so delightful that with its freshness and continued change it made us forget all the troubles and worries to which the shallow stream and the recently-started plague of sandflies had given rise. From now on down, the coarse-grained ferruginous clay

conglomerate covered the river bottom in isolated places with huge boulders. In the sharp bend towards the East, the Capaya (*Carica Papaya*), which is as big as the Pirara, opened on to the left bank. Not far from its mouth there rose several sandstone banks rich in clay, the first evidences of the formation met with for a long time past, the smooth upper surfaces of which exhibited several impressions, probably of isopods. The stone showed a number of partly rounded, partly rectangular excavations often with a diameter of from 6 to 8 inches. We had pitched camp on the right bank about an hour's journey above the mouth of a small stream, the Mucumucu, that has its source on the Quariwaka (Cloud Mountain) one of the highest elevations of the Canuku Range, for the purpose of spending a few days while waiting for Mr. Fryer whom we had arranged to meet here as soon as Petri's condition should allow of his leaving him: at the same time the halt was necessary to allow of our sending several Indians to the Macusis living in the ranges to induce them to bring cassava bread and other provisions in exchange for trade. While our natives were yet busily engaged in clearing the camping ground, we were all startled by a sudden shriek from pretty Baru, who was just about slinging her hammock a little distance apart when she was checked by a large rattlesnake (*Crotalus horridus* Daud.) that with upraised head was making ready to spring. It was killed before it could carry out its intentions: the rattle was composed of seven rings.

41. While our stay here was utilised by my brother in determining trigonometrically the height of Ilamikipang which by a cursory calculation turned out to be 2,500 feet, I spent my time collecting plants on the forested river border and adjoining savannah. The former likewise consisted here of Cucurit and Sawari palms, *Erythroxylon, Tecoma, Mimosa, Jacaranda* and *Byrsonima* among which latter a new species, *Byrsonima tenuifolia* Klotzsch, which had as yet put forth no leaves, amazed me by the beauty of its peach-coloured blossoms. On the edge of the savannah there bloomed in particular a lowly *Calathea* with yellow flowers with which was intimately associated a thickly crowded streak of delicate *Hypoxis breviscapa* Humb. Bonp., its similarly coloured floriage reminding me strongly of the *Ornithogalum luteum* Linn. of my native country. The *Byrsonima verbascifolia* seemed to have forced all the remaining genera and species out of the savannah, because only now and again could one see some low bush of *Byrsonima crassifolia* emerging from out of its thick felt. In many places big boulders of a erruginous conglomerate alternating with huge white ant-hills raised themselves above the low lying vegetation, while alongside them giant *Cactus* for the most part stretched out their prickly arms and lent something of a change to the otherwise uniformly dreary savannah picture.

42. The quantity of deer procured by our men on their hunting trips in the savannah, and the large number of scaled denizens of the deep brought by the fishermen into camp, clearly indicated that the former must be just as abundant as the latter. Among the fish my attention was particularly directed to several Pirai (*Pygocentrus*) on account of their dull black colouring and anomalous pigmentation of iris which was also black and surrounded with a golden yellow ring. One of them measured



INSIDE OF A WAPISIANA HOUSE.

1 foot 5 inches and was 8 inches thick: probably it is only a variety of *Pygocentrus niger.* Unfortunately the small size of my spirit-container did not permit of my taking a specimen with me. The tasty Colite of the Arawaks, Corutto of the Makusis (*Platystoma tigrinum*) was brought to us in extraordinary quantities. One of them weighing 16½ lb. measured 2 feet 11 inches in length and 1 foot 8 inches in circumference. For me, independently of its generally tasty flesh, it was always an extremely welcome dish, because except for its few ribs it hardly possesses any bones: a property that is worth double to a hungry stomach.

43. The cooking pots of our Indians did not come off the fire during our stay in camp: when one of these was emptied, it soon returned refilled to the burning wood-stack. Here I first learnt what an Indian, when the will corresponds with the supply, can do in the eating line. On several occasions I saw them collected round the pot 3 or 4 times within 5 to 6 hours, consuming the last feed with the same zest that they started with.

44. As the real meal-time fell mostly between sunset and sunrise, the women, who had nothing to do during the course of the day, hurried into the forested borders of the River to collect the ripe fruits of the *Mauritia* or *Psidium* as well as other edible products which they would then consume lying in their hammocks, and so while the time away.

45. Already on the second day after our arrival, a quantity of provisions, cassava as well as yams, plantains, and potatoes were brought to us from the Indians living at the foot of Ilamikipang. The sellers were my old friends from Curata-kiu village, where I had been present at the preparation of Urari. One of the boys brought me an armadillo (*Dasypus villosus* Des.) which he had surprised on his way across the savannah. To prevent its escape I tied a string fast to its foot, but hardly had we left it unnoticed than in a short time, through the unusual muscular strength of the front claws, it had buried itself so deep in the hard ground, that it was already out of sight. Although we could still seize the hind-feet, the Indians who tried their luck nevertheless did not succeed in pulling the animal out; it seemed so tightly jammed against the walls of the excavation that they might have brought out the torn-off hind foot before they extracted its owner. So as not to torment the anxious creature any further, I gave it its liberty, an act with which my helpers did not appear to be at all in agreement, because with it one of their most favourite tit-bits had escaped them. The rapidity with which the armadillo buries itself in the ground especially when scenting an enemy in the neighbourhood has often aroused my astonishment since: three minutes, even when the ground is not holey, is sufficient for it to hide. During the digging it scratches the ground loose with its fore-claws and scrapes it back with the hind ones in such a way that the tunnel is at the same time closed.

46. The wailing and whistling of a bird that could be heard in the thickets, equally as well during the course of the day as at night had already aroused my curiosity the very first hour after pitching camp without my even succeeding in seeing it, for it always kept quiet as soon as it noticed the rifle. It was only by claiming the help of an

Indian that I managed to secure it. It was the smallest of owl hitherto known to me, *Strix passerinoides* Tem. Like all remaining owls, it perches quietly in a dark shady spot in the thickest bush and almost continuously strikes its really quite peculiar note of lamentation at regular intervals.

47. According to the statements of the Indians visiting us, the next settlement lay 4 days' journey up the stream, indeed, in close proximity to the Cursato Range, where the district of the Wapisiana commences: the overland journey shortens it by a day. My brother got these latter to inform the people who had been following the river-bank of the Takutu to wait for us there. According to the observations taken, our camp lay in 3° 20′ 37″ lat N., while the thermometrical (Fahr.) records gave the following mean results:—

1842	6 a m.	9 a.m.	Noon.	3 p.m.	6 p.m.	Remarks.
8th to 10th April	74.57	79.67	86.17	91.17	84.84	Sky mostly clouded: a strong N.N. & E. wind was blowing at the same time,

Throughout the day, the wind almost regularly blew out of the N.N.E. till it apparently died away towards sunset; it sprang up again regularly after 8 o'clock of an evening in the West, and then turned towards N.N.E.

48. As up to to-day, the 11th April, we had received no news from Fryer we struck camp and resumed our journey up the River. Huge glassy-surfaced boulders of ferruginous conglomerate heaped one on top of the other covered whole areas here, as on the Rupununi, (and according to my brother's accounts), Rewa and Quitaro. The loud barking and yelping of a dog that seemed to follow us continuously along the bank, naturally aroused our curiosity, when the cause itself appeared at the waterside, jumped in, and swam after us. Forced to surmise that he belonged to the Indians, who had brought us provisions and who were accompanied by a large number of dogs, we did not want to take him into the boat: but he bravely swam behind, and as soon as he got tired, turned to the bank, where, barking and yelping he again ran after us. When we landed towards evening he was immediately at our side, licked our hands, wagged his tail and jumped around in the most friendly fashion. Had his appearance not already betrayed his Portuguese descent, this friendliness towards strangers would have established it. Having followed us so indefatigably we took him under our protection, only to regret it sufficiently enough afterwards because he was absolutely no hunting dog, and only too often frightened the game away with his barking. Want of space in the boats forced him next morning to continue his journey on foot along the bank.

49. In the course of our journey to-day we passed the mouths of the Camu and Awarrimani: the former has its source on the slope of the Ilamikipang. Beyond the junction of the Awarrimani we reached

the first of the Takutu rapids, which, however, was so insignificant that we were able to pass over without stopping. Some miles farther up, on the same bank as the Awarrimani, is the mouth of the small river Maripa-outé which also has its source on the western spur of the Canuku Range. The nearer we got to the Canuku Range, the more numerous were the bends in the Takutu and the more difficult became our passage. The mighty heights of Cumucumu, the Cerro d'Eldorado or Cerro Ucucuamo of Santos' diary, the Acacuamo of Caulin, divide the waters of the Rupununi from those of the Takutu. The former has broken through the mountain-chain. The latter, however, after receiving the Mahu, makes a sharp bend from its south-easterly and subsequent westerly course towards the S.W. to the Rio Branco, although after its junction with the Mahu it really no longer deserves its name: the Mahu at all events in the course of its continued south-westerly course ought to be regarded as the main stream, a view already held, according to Alexander von Humboldt, by Nicholas Hortsmann, the first European traveller to visit these districts.

50.. The western extremity of the Canuku Range ends in the 2,000 ft. high Curatawuiburi: the southern spurs are far more of the nature of mountains divided and isolated from one another by savannahs than a connected chain.

51. The closer we reached Curatawuiburi, the shallower became the water, and the greater our troubles, because we often had to empty our boats several times a day, and drag them over the sandbanks: on these occasions our persistent four-footed friend would always after a short while come and join us again with the liveliest signs of satisfaction. At one such spot full of sweat and sorrow my attention was forcibly drawn to a strikingly loud screeching and scratching that came from out of the wooded waterside. As I cautiously neared the spot I saw an immense crowd of large birds in front of me: they were Tufted Hens, *Opisthocomus cristatus* Ill., the Stink-birds of the Colonists. Although the former name, on account of the long head-feathers is sufficiently distinctive, the creole term nevertheless emphasises with still greater propriety one of their most predominant peculiarities, for without seeing them, one becomes notified of their presence even at a fair distance away, and even then not in the pleasantest of manners. The smell is so disagreeable that even the Indians, in spite of the abundant flesh, will not eat the bird under any consideration. The swarm certainly numbered hundreds: some were sunning themselves, others were hunting round in the bushes, and others again were rising from off the ground: it appeared to be the pairing season. A shot from my gun into the merry crowd killed several at once. When the bird raises its head, it has quite a proud appearance. Among the older birds, the long tail feathers had their tips as well as their filaments rubbed away, a demonstration that they commonly run about on the ground to search for food, when the long tail-feathers come into contact with it. The stink very much resembles that of fresh horse dung, and is at the same time so intense that even the skin retains it for years. Except at this spot, I never found the bird again.

52. The ever-increasing number of sand banks were made up partly of drift sand, partly of rubble formed of a coarse or fine-grained quartz with exquisitely beautiful chalcedony pebbles of a white or yellow colour: equally plentiful were large pieces of so-called fortification agate, as well as melaphyr below that, out of which material the chalcedony pebbles arise. But however interesting their geological ingredients naturally were, the resulting effects of their presence proved equally unpleasant and troublesome for us when, towards two o'clock in the afternoon, they rendered a temperature of from 126° to 130° F. almost unbearable. At last we had to get out of the corials altogether and continue our way under great difficulties: we had to drag the boats behind us over the increasing 100 to 120 foot wide sandbanks stretching like dunes towards one or other of the banks, over ground that towards 3 o'clock reached a temperature of 110° F. and that owing to its glare and glittering whiteness, blinded and inflamed one's eyes. And yet this was not the worst trouble in comparison with the legions of sandflies, for we had no means of protecting ourselves from their terrible onslaughts on face and hands owing to our being almost all the time engaged in shoving corials over sandbanks. The effects of the sun-burn soon appeared because even to-day every one of us Europeans looked as if feet, hands and face had been wrapped in Spanish fly-plaster: the large straw hat had been unable to prevent our faces being blistered. Even my brother whose skin had already been used to this temperature for years was not spared. The pain caused by these heat-blisters is double that of any other burn: ears, nose and neck were the parts mostly troubled, and I believe that on the Takutu journey they were skinned from 6 to 8 times. When in the course of dragging the corials along we had to wade in water, and came to a spot somewhat shallower than usual where our tucked-up trousers left our legs partly exposed, these also became covered with blisters in a twinkling. Only the Indians suffered nothing, and they laughed when we complained. In spite of this so-to-speak red-hot soil, some *Psidium* bushes as well as many a *Mimosa*, *Desmanthus*, legume-like *Boraginea* and *Convolvulus* gained their miserable living in it.

53. We had never before longed so sincerely for the coming evening breeze as we did this very painful day, for it not only fanned our burning faces cool, but also drove away the legions of sandflies, the bites of which proved all the more troublesome as we did not dare scratch our wounded necks or faces.

54. Although a number of *Mycteria*, *Ciconia*, *Ardea*, *Ibis*, *Tantalus*, *Anas*, and even the beautiful Orinoco goose (*Anas jubatus* Spix) put in their appearance along with the sandbanks, all taste for hunting was lost owing to the sufferings we endured. That a large number of water-fowl must migrate to other better-watered districts during the middle of the dry season was evident from these crowds of birds which though still numerous were nevertheless small as compared with the swarms met at Lake Amucu, and from which were missing a large number of species that I had already became acquainted with there. Although the Glutton-bird remains on the savannah swamps in innu-

merable flocks not only during the rainy season, but even long after, its nest is nevertheless absolutely unknown. On enquiring the reason the Indians told me each time, "The bird flies far, far away"—at the same time pointing to the South—"he breeds there, and long afterwards returns to the savannah with the young." Though one must not always give absolute credit to the statements of the Indian—because owing to his natural wit he only too quickly gets to learn what the traveller wishes to hear, and accordingly either dishes up in plenty what suits the latter's curiosity, or at least presents it in drapery woven from the thin deceitful threads of false and unfounded natural appearances and a whole fabric of superstitions—the statement nevertheless in this case, judging from our own experience, did have a sufficient basis of truth. For on many occasions and throughout the long periods we spent in the savannahs of the Rio Branco, Takutu and Rupununi, as well as in the areas situated to the east and north of them, we came across the bird in the wet season of the year everywhere and frequently, yet we never found its nest, though judging from the creature's size, it must be fairly conspicuous and striking to the eye. We have also made the same remarks in the case of the *Ciconia maguari* while we found the nests of the *Mycteria* plentiful on the large trees of the hemmed-in borders and forest oases on the Mahu, Takutu and Cotinga.

55. The ugly Matamata turtle, which we had not seen since the Essequibo, was fairly plentiful here. It usually dug itself into the sand at the edge of the water, so that the surface of the latter lay about 2 fingers' breadth above it, where it seemed to lurk motionless for its prey: it allowed itself to be caught just as quietly, but this was certainly only rarely done because, besides its beastly look, it emits a loathsome stench. Though among the quadrupeds we now and again saw tapirs they were so continually on their guard that they were already making off for the dim distance. The water-haas proved less shy. I often found 6 to 8 of them together always forming a line in the middle of which the young were to be seen. But unless we killed it outright the wounded animal every time escaped us by immediately rushing into the water, the neighbourhood of which it seldom left, and where we waited in vain for its return: only when the Indians shot one with the poisoned arrow was our patience now and again rewarded.

56. On 13th April we reached the first important Rapid, formed by a bank of metamorphic greywacke-slate* crossing the river at 56½° W.: in isolated places it showed large quantities of granite, while in others this was entirely wanting. Rapid soon followed Rapid, which however were no longer composed of the greywacke-slate, but of innumerable granite and gneiss boulders, that traversed the stream partly as isolated masses, partly as closely-opposed rocks. Our torments and troubles could only just have reached their culminating point because the unloading and hauling of the corials had now to be tacked on to the labours hitherto performed by us: these boats had often to be emptied

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* No mention of greywacke-slate is made in other accounts. (E.E.W.)

more than once daily and, in spite of their trifling size, the difficulty of dragging them over was doubled by the fact that the spaces, through which the small amount of water poured, were at most only from 2 to 4 feet wide. When we did manage to overcome such a rocky obstacle, the water banked up behind it did certainly afford us an opportunity for taking a rest: but for how long did this last? After three or four hundred strokes with the paddle, a fresh barrier was already there to block the way again.

57. In spite of our manifest sufferings and sorrows it was fortunate our stomachs did not have to starve; we were not only handsomely supplied with bread, but the river also offered our huntsmen and fishers a most abundant harvest. The rocky crossings teemed with beautiful and tasty muscovy ducks (*Anas moschata*). It is undoubtedly the wild progenitor of the muscovy-ducks so plentiful in our larger fowl-yards. It seems to have received its common designation from the mistaken idea that it was imported from Russia. As Azara found it even in Paraguay, it would seem to be distributed all over South America. I cannot rightly understand how it has aquired its specific name of *moschata* because there is no trace whatever of a musk smell. During the oppressive heat at midday and afternoon the birds generally pick a shady spot on the river sides or on the sandbanks: morning and evening they search for their food which consists of fish, snails, algae and other water-plants. The male is considerably larger than the female. They build their nests partly in hollow trees on the banks, partly, as people assured us, on the *Mauritia flexuosa*, especially in swamps, where immediately the young come out of the egg the old mother has to take them in her beak down to the water. Whether the last statement is a fact, well, I will leave it at that: I have never seen it myself. That the birds sleep by night only upon high trees, and always fly to such big ones when scared during the day, I have regularly had opportunities of learning from my own experience. Even those which, during the day, remain in the swamps, fly at sunset to the forest oases or river banks to sleep there on the lofty trees. Their flight is uncommonly swift and always accompanied, especially on rising, with a loud and hollow noise, something like that of our partridges when rising. In May, as in September, we found young that were being carefully watched over by their mother. On the slightest danger the latter at once rushes them to the thickest scrub, out of which she entices them with a special call as soon as it is over. The pairing season appears to give rise to the most sanguinary encounters amongst the males: at least, we found at these times large areas strewn over with feathers. If the duck is not mortally wounded, and there is any thicket close by, it mostly escapes the huntsman, because it immediately slinks off in such a way that even the Indians do not always succeed in finding it. Still more plentiful however than the ducks were the blue Macaws. On approaching the trees where they perched, they rose in pairs with a deafening screech and, making an awful row, circled around us. The male and female in most cases sat chattering together all the while in a peculiar knurring tone: when a deadly shot happened to knock one of them over, the other would fly around the tree and branch uttering a

wailing sound, return to the spot, and look in vain for the vanished partner. This fond affection between the two appears to be peculiar to the whole genus. It is strange that the companies of both species of *Araras, A. macao* and *A. ararauna,* should keep strongly apart from one another: I cannot call to mind a single instance where one species was seen in the neighbourhood of the other. Prince von Neuwied regarded this alleged segregation as a myth;—my brother and myself have to make the statement as the result of several years' experience. Besides the savannah Hokko-hen (*Crax tomentosa*) the *Crax alector* was also frequently shot along the edge of the banks. It is remarkable that during this month both species emit a strong onion-like odour which permeates the flesh to which it gives an extremely *piquant* taste. It is highly probable that certain kinds of seeds or fruits which reach maturity this month are the cause of it, although the contents forthcoming in the crops of the dead birds furnished no explanation (Sec. 1,009). As we found such a plentiful supply of wild fowl here, it was natural that we did not trouble about the equally large numbers of tough *Penelope paraca* that enlivened every bambu-bush on the embankment with their sharp pheasant-like call.

58. For the past week I had been attacked with occasional bouts of ague-fever which unfortunately I could not stifle at their onset because Mr. Fryer had forgotten to put the quinine in the medicine-chest when he left it behind with us on his return to Pirara. To-day this unwelcome visitor notified me of its actual presence to a fairly reasonable degree and I had to thank our forgetfulness for having to carry fever round with me over the whole Takutu trip, only succeeding in getting rid of it after we got back to Pirara. From an astronomical observation our camp since the 12th April was found to be situate in 3° 12′ 51″ Lat. N and 26.6 miles west from Pirara.

59. The stream maintained its rocky character also on the following day; indeed it actually increased to such an extent, that isolated boulders now reaching a height of from 20 to 30 feet, piled above and below one another, were lying scattered around in the river-bed. Mt. Curatawuiburi lay N. 73° E. from us: it also appeared to be the main direction of this granite layer. And though our troubles were accordingly many times worse than yesterday's, the aggravated misery of the sand-flies (*sandfliege*) kept pace with them. Just as in autumn sometimes a cold current of air unexpectedly penetrates the moisture-saturated atmosphere and produces a sudden mist, we often found ourselves enveloped in a like cloud of flies. The blood-thirsty creatures then suddenly started attacking us in swarms, and driving their strong short sucking snouts into our skins so as to cause much pain that every moment became worse, the wretches finally filled themselves full. While they suck, the skin rises like a half globular swelling, becomes suffused with moisture that, mingling with the blood when the insect has flown away, dries up after a while, and produces the red spot which as I have already noted, (Vol. I. 777) is visible for several days before falling off. So long as the bites remain isolated the irritation is always bearable but when these harpies come in such swarms as they did here, they are apt to cause

not only inflammation but also regular abscesses. They could not however be more numerous than they were, so what wonder then that our faces already wounded and blistered by sunburn assumed an even more shocking appearance to-day. A cool current of air now and again took pity on us in the course of the forenoon and scared the hungry merciless swarms away for at least minutes at a time: though in the afternoon this also disappeared and the oppressive heat increased to such an extent that the thermometer recorded a temperature of 108° F. in the shade. Beating off, "shoo"-ing away, in short, every attempt at ridding ourselves of the pest remained fruitless, and with a truly despairing resignation we yielded to the inevitable.

60. During the afternoon we passed on the right bank the mouth of the small stream Sawara-auuru. Sawara is, as I have already remarked, the Indian name for *Astrocaryum Jauari*, and auuru is the name for river in the Wapisiana language.. By means of this stream and an insignificant portage, one can reach the Rupununi in 3 days. This path has an historical importance in that, according to Alexander von Humboldt, it was the road taken by Surgeon Hortsmann in 1739 when he left Demerara to search for the gold and diamond mines in the interior, and was also the route followed, according to the same authority, by Francisco José Rodriguez Barata when in 1793 he twice had to take despatches from Pará to Surinam. The Indians and Brazilians still use it, especially in the rainy season. The spread of the granite and gneiss beds continually ran from S. 10° E. to S. 10° W.. The gneiss almost generally shewed a black colour, and only now and then did it appear more yellowish. Here and there we again found those metamorphic slates with quartz-veins while other banks consisted of a weathered mica-schist, yellow jasper, and coarse and fine-grained quartz-rubble.

61. There was a similar glut of fish as there was of sand-flies on the appearance of these rocky bars: amongst the former the beautiful Arowana (*Osteoglossum bicirrhosum*) already mentioned was extremely welcome. There was little difficulty in catching them in these stony labyrinths because we had only to close off the spaces between several of the rocks, when the Indians slashed away with their cutlasses at the fish that were shut off, or else shot them with their arrows, if the particular spots did not permit of the butchery. A number of Pirapoco or Morowai (*Xiphostoma Cuvieri*) were associated with the Arowana and like them always swim on the surface. Their pretty variegated scaly dress takes on a uniform brown colour when they are removed from the water.. I found here for the first time the *Hydrolycus scomberoides* Müll. Trosch., the Patha of the Macusi, provided with two teeth 3 to 4 inches long, which seem especially to like the rocky spots of the savannah rivers. Quite as astonishing to me as their teeth, was their muscular strength, which was rendered particularly noticeable by their swimming here and there for quite a time with the six foot long arrow that had transfixed them. The two powerful teeth, bent somewhat inwards, lie in the lower jaw and, when the fish shuts its mouth, slide each into a round hole situate in the upper one. The flesh is indeed not tasteless,

but so full of bones that a hungry stomach would rather try something else. Its food consists of small fish which it swallows whole. Like the Pirai it often in its greed cuts through the fishing-line with its sharp bite. The teeth mentioned give the fish a curious appearance wherein according to my experience it is only surpassed by the armour-plated *Hypostomus** which was also represented here by several species.. As they remained for the most part at a constant depth in the crevices between the rocky boulders the Indians dived in to pull them out of their lurking spots where, as their captors maintained, they can be heard making a peculiar noise. The *Sudis gigas* also put in an appearance again in the deeper places.

62. Where the savannah reached right onto the bank, this generally fell away in 15 to 20 ft. high abrupt walls. Among the *Curatella* I also noticed here and there the *Bowdichia major* Mart. which though lowly was overstrewn with blue blossoms, several *Malpighiac* as well as certain *Leguminosac*, particularly *Clitoria* Linn. (*Vexillaria* Hoffmsg.) that at least lent to these sterile flats a somewhat more lively appearance than that offered by the savannahs of the Mahu and Pirara. At all events, what with the grass having been burnt and already replaced by young growth, this green carpet helped in large measure to reconcile me once more to the monotonous flats.

63. We had likewise noticed that besides the ordinary Kaiman, the Takutu also harbours a smaller species (*Champsa vallifrons* Natt.) called Kaikutschi by the Indians, the flesh of which, next that of the Iguana, is considered to be a very great delicacy. Late in the afternoon we were yet to witness a highly interesting fight. On the farther side of the first rubble-bank mentioned above, the river lay before us in a deep and smooth stretch through which the corials were again able, after a long interval, to make their way without hindrance. Seeing an unusual movement in the water straight ahead, and but a short distance away, we made our Indians pull quicker so as to get close to the spot as fast as they could. A huge Kaiman had just seized a Kaikutschi at its middle so that head and tail projected on either side of its awful jaws. The fight was furious and extremely interesting but all efforts of the weaker creature remained fruitless against the mettle and greed of the stronger. Both now disappeared and only the ripples of the otherwise calm and peaceful surface indicated that a struggle for life and death was taking place below: after some minutes they emerged, and whipping the water with their tails splashed it away in all directions: the result however was soon no longer doubtful: the powers and efforts of the Kaikutschi ceased: we paddled closer: on the Kaiman noticing us he dived under, but as he could not swallow his prey in the water he bobbed up some distance away and swam to a small sandbank where he immediately commenced his meal.

64.. Just as the less obstructed water-way considerably lightened our day's labours, so on the 14th a cloudy sky and a cooling wind from the E. by S. proved our most welcome companion since starting the journey: at 11 o'clock the thermometer was 90° F. In the course of the day we again passed a huge 50 to 60 ft. high bank of quartz-rubble which was cemented by a ferruginous clay into immense conglomerate boulders. As the sandbanks proved likewise plentiful on the other side of this huge rocky reef, the river thus resuming its original character, the rest of the party busied themselves in dragging the corials over while I hurried ahead with the gun to search for duck along the shaded spots on the banks, and make sure of a tasty meal for the evening. The clear water allowed of my watching the funny antics of a couple of sting-rays that were just then enveloping themselves in the sandy bottom close inshore, and this so claimed my attention that I forgot everything around and near me, until I was suddenly roused out of my reveries by a deep snarling and growling. Judging from my experience on the Canuku Range, it could only be a jaguar, and on glancing up, dismayed and appalled, I actually saw an immense beast some ten to twelve paces in front of me. There he was at the water-edge, his eyes sparkling and rolling, his tail touching the ground; very likely he must just then have come for a drink from out the thick scrub bordering the stream. He was probably quite as much disgusted at my presence as I was frightened at his: for I must admit being so much upset at first by the unpleasant encounter that I returned his fixed and fiery gaze with a scowl equally ferocious. Are you going to shoot? was my first thought.—No!—for but one of the two barrels is loaded, and that only with duck-shot. What are you going to do then? Bear away backwards, always keeping the enemy distinctly in view. No sooner thought than done; so without turning my eyes from off the huge creature that was showing his immense teeth, and not giving a single thought to where my crab's march might lead, I made my way back. The jaguar remained still, continued to stare, to hiss and to snarl until he suddenly disappeared from sight in a bend of the river, when I now "right-about wheeled," and hastened back to the boat as hard as I could pelt. When we returned with guns and bullets, he had withdrawn into the bush, where we did not succeed in finding him. The fright was not insignificant, for the consciousness of having no weapon at all suitable for such an enemy is more paralysing than the greatest danger that one may be prepared for.

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*The iméri of the Macusis. (Ed.)

65. We found deeper water again some way above the ominous sandbank. Six otters seemed as if they wanted to contest our right to it, because they continued swimming around with their peculiar snorting and barking, at the same time raising their bodies half-way out of the water, and exposing their terrible sets of teeth. They came so close to the corials that the Indians were able to hit at them with their paddles—but the next moment they would dive and reappear directly with renewed fury. This activity led me to believe that their young were in the neighbourhood, because although before and since they always approached to within a certain distance of our boats with that angry barking of theirs, they never made a regular attack on us as they did in this case. One of them got wounded here, but immediately

dived: the water became tinged with blood, but the animal did not show itself again. If we surprised them whilst gorging their spoil on the banks or on one of the rocky boulders they rushed to water down the former as quick as thought but nevertheless on such occasion one behind the other, or else jumped into it from the latter one after another. They very generally have a fixed spot where they devour their prey, the envirous of which are absolutely pestilential owing to the remnants left behind, including head, tail and bones. The smaller species generally hunt in companies of from eight to ten. Swimming in a cross-line against the current they suddenly dive, continue their progress under water for ten minutes or so, seize by the belly any fish passing above them, and drag it to their feeding-ground where they leave it, and immediately hurry back to the water and resume the pillage. It is only when a quantity has been gathered that the members of the company commence on the common meal. The Indians turn this peculiarity to their own advantage: they sneak warily into the proximity of such places, wait quietly by, until the otters have deposited their booty, and remove it as soon as they return to the water. Otters will seize the largest fish, even the *Sudis gigas,* and often drag 12 to 15 lb. weight to the bank. My brother was witness on the Corentyne when an otter of the smaller species that had dragged a 12-lb.. Haimara (*Macrodon trahira*, Müll., *Erythrinus macrodon* Agas.) up a boulder-rock, absolutely declined being interrupted gnawing away at it by the shouts of his accompanying Indians: only when some of the latter jumped into the boat and paddled towards the creature did it surrender its spoil. The feeding-grounds just mentioned are recognisable in addition to the pestilential stench of their surroundings, by the deeply excavated pathway leading to them. Otters take up their quarters in holes along the banks. The young appear to remain a fairly good time under the protection of their parents. When danger threatens, the mother seizes the young in her mouth and springs into the water: when it is past, she appears once more on the surface snorting angrily. Nevertheless the Indians know how to outwit the old ones, and manage to steal their young, taming them so that they may run after them like dogs. They feed them with fish, flesh and fruits. The skin of the larger species is dark mouse-drab on the belly, on the back almost black, the head also mouse-drab: the breast shows a milk-white spot. The snout is short, and possesses a strong "beard": the feet are just as uncommonly short. The peculiar bristly hair is thick: the woolly pelt on the other hand is uncommonly fine and of a lighter colour. The length of the smaller species amounts to upwards of 4 feet, of which the tail takes up from 13 to 14 inches. Their colour passes from clear mouse-drab rather to reddish. The belly is white, like that of the breast-spot also found on it. In their habits they correspond entirely with the former except that they do not, like them, live in pairs, but in companies. It would seem to me, that the head is comparatively broader. The Arawaks call them Assiero, the Caribs Avaripuya, the Tarumas Carangneh, the Warraus Etopu (smaller species) and Itscha-keya (larger sp.). On the coastal rivers, especially in the Demerara, there is yet present the Bank-otter (*Pterura Sambachii*).

66. Our camp to-day, situate in 3° 1′ lat. N. on the left bank of the Takutu, was enclosed with innumerable bushes of the Eugenia that we had already found at Pirara: here also the delicate branches bent under the weight of their fruit. The *Outea acaciaefolia* Benth. with its beautiful feather-like leaves was likewise present in large quantity.

67. That the condition of our naturally very frail vessels should daily be getting worse became more and more patent, and was not at all to be wondered at considering how they had been continually dragged across sandbanks or hauled over granite ridges and rubble dams. For the last two days, as soon as each of the corials got into deep water, a man was constantly kept employed bailing out the invading water. The Great Fall of Scabunk, the biggest we had as yet met, proved a considerable obstacle next day. It has received its name from the little river Scabunk, which, from the Eastward, joins the Takutu at the foot of the cataract. Catu-auuru as the Wapisianas call it, means the same thing as Scabunk-outé (Sandy River), in view of the immense sandbanks at its edge. We had already hauled two of our corials successfully over the rocky barriers, when an accident put a stop to our journey for the day.

68. Among the many fish peculiar to the Takutu, the Sting-ray of the Colonists, owing to its numbers, occupies one of the foremost places As I mentioned previously it shovels its flat body in such a way into the sand or mud that only the eyes are free, whereby even in the clearest water it escapes the view of a person wading by: should the latter now unfortunately tread upon or disturb one of these cunning creatures, it whips out its tail and strikes vigorously at the mischief-maker. The tail is provided with a bony saw-like jagged double-edged spine and gives rise not only to very critical convulsions, but can even cause death. Our Indians, knowing their dangerous enemy, always prodded the water immediately ahead with a paddle or stick as soon as they had dragged or pushed the corials over a bank. In spite of this precaution, one of our boat-hands, the Arekuna Indian Awacaipu, was nevertheless wounded twice on the instep by one of these fish. Directly the poor fellow got stuck, he staggered on to the sandbank where he collapsed and, biting his lips with the raging agony, rolled about in the sand: yet no tears flowed from his eyes, no cry passed his lips. While still engaged trying to alleviate his sufferings as much as we could, our attention was distracted by a loud shriek to long-suffering Cumeru who had been so dangerously bitten by a pirai at the mouth of the Pirara and whose injury was still not healed—a second wound had just been inflicted close to the first one on the same foot. The boy had so far not acquired the firmness of character requisite to repress, like Awacaipu, the expression of his pain: with a piercing cry of suffering, he threw himself about on the ground, dug his face and head into the sand, and even bit into it. I have never seen an epileptic suffering from convulsions to such an extent. Although Awacaipu had been wounded on the instep, and Cumeru on the sole of the foot, both nevertheless felt the greatest pain in the privates, the neighbourhood of the heart and under the arm-pit. Though the fits were already apparently bad enough for the Arekuna, they took

on such a serious turn with the boy that we were forced to believe the worst. After getting the wounds sucked out, we tied ligatures, used a wash of laudanum, and then applied continuous mollifying poultices of cassava bread. The symptoms had very much resemblance to those accompanying snake-bite. It is impossible that this absolute nervous breakdown can proceed from the mere wounding alone; very probably it must be ascribed to the poison combined with it. A powerful and lusty labourer who, shortly before our departure from Demerara, was stuck by a sting ray on Zeelandia Estate died in the most awful convulsions. The Indians utilise the saw-like spines as arrow-tips, and as lancets for blood-letting.

69. Where the water had somewhat washed away the sandbanks a white gravel was exposed in several places. The spread of the compact craggy masses was S. 20° E., in connection with which the rocks showed a number of veins of different formation, about two feet wide, which ran through the strata N. 60° E.: quartz veins in plenty also pushed their way through the body of the range in E. 15° S. Mt. Mariwette or Taquiara raises its head about 2 miles distant from the left or western shore; its height is some 2 to 300 feet.

70. Although the sufferings of our patients had somewhat subsided on the following day they were still quite unable to use their feet, on which account we had to bring them along in the corials. We continued our journey under the difficulties hitherto met with until the growing number of rapids and cataracts increased them to such an extent as to make us almost despair of contesting them further. Huge granite and gneiss boulders often 40 to 50 feet in diameter, blocked the river almost step by step.

71. After engineering the great Curucuku Cataract with extreme difficulty and just when we were sweating ourselves in dragging the corials over the next-following Falls of Matzipao through a three-foot wide crevice, the only watercourse which it presented, we heard human voices in the bush alongside the bank: to our undisguised joy, Sororeng soon stood before us in company with a huge muscular but phantastically dressed Indian whose noble and fearless features would have done credit to the proudest Roman. His wonderful feather head-dress was made from the snow-white feathers of the South American Eagle (*Harpyia destructor* Tem.) which, like ostrich plumes, hung in beautiful arches over a forehead-band composed of green parrot feathers. The septum of the nose was bored and in the opening swung a beaten-out and highly polished piece of money: in the ear-holes, also pierced, he wore rounded six-inch long little sticks of "letter-wood" (*Brosimum Aubletii*) which were decorated at the one end with variegated feather-bunches. The beautiful powerful figure, the fantastic decoration and the wonderful black shiny hair hanging a long way over the shoulders was something so striking that I gazed at the man for a considerable time in surprise: it was a Wapisiana.

72. According to Sororeng's account the overland party had already reached the Wapisiana settlement of Tenette in the neighbourhood of the Cursato Range on the third day after their departure. Upset by our protracted absence the brave fellow had made up his mind to come

and find us, which happened sooner than he expected, because the village was only a three hours' journey from here. This information roused us all to a state of the happiest excitement, which was certainly somewhat discounted on learning that on account of a failure in the crops the provision fields were in so miserable a condition that several of the inhabitants were already on the road, while those remaining were for the most part forced to satisfy themselves with palm fruits instead of with cassava bread.

73. The idea of following the river farther by corial had already been abandoned yesterday, and Sororeng's information, that we only had to do another three hours before reaching Tenette, stopped all further delay in carrying out our resolution. The great Cataract, now certainly without water, showed on its summit a regular plateau of granite with unusually large and numerously embedded masses of quartz, while it was also dashed with transparent quartz-veins like the stone with similar ones that we had already noticed at Seabunk (Sect. 69).

74. Half a mile above Dabaru Falls we reached the longed-for landing place of Tenette, in the neighbourhood of Cocoya, the great Cataract that is formed from the mountains rising on both banks; Mt. Wawat on the western, and Mt. Tatat on the eastern. The river also becomes narrowed here through a confusion of granite and gneiss rocks. Both mountains are of trifling height. So that our things might be got to the village by the following morning, Sororeng went there direct, to bring not only our own people but also some of the Wapisianas to help transport them. We ourselves commenced discharging, and found that the water, in spite of the continued bailing, had unfortunately made its way through certain spots in the damaged corials, and had rendered several articles useless.

75. Early morning already brought us some of our people and some of the villagers: the loads were divided and the journey commenced. A fair-sized hill, rising by itself in the savannah to the south-east of us immediately attracted our attention: it was the small Mt. Tenette, after which the Wapisianas had named their settlement situate on its south-eastern slope. A woodland flat at its base, stretching half way up the hill, gave it an unusually pleasing appearance. The interest that the varying flora* had already aroused in me on our way through the somewhat swampy savannah was specially increased by a glorious hyacinth-like scent that a stronger current of air would now and again convey to us from the still seemingly distant wooded hill. The closer we approached, the more was the air impregnated with the lovely perfume, and the greater was my curiosity aroused as to its source, which was soon to welcome me in several trees of medium height covered with numerous white blossoms. Like the scent, the flowers have extraordinarily great resemblance to our simple white hyacinth. On closer examination, I recognised it as a new species of *Tabernaemontana*, and named it after Alexander von Humboldt: *T. Humboldtii* Schomb. The tree is distin-

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* *Bowdichia major* Mart., *Buttneria divaricata* Benth., *Licania pendula* Benth., *Clidemia campestris* Benth., *Cuphea antisyphilitica* Humb. Bonp., *Elephantopus carolinianus* Willd., *melochia melissaefolia* Benth., *M. fasciculata* Benth., *M. lanceolata* Benth., *Ayenia tomentosa* Linn.

guishable not only by its glorious sweet-smelling blossoms, but especially on account of its beautiful large glossy dark foliage, and is unquestionably one of the loveliest ornamental trees of the tropics. A thick border of *Agave vivipara* Linn. enclosing the forest edge and forming with its huge floral candelabra a regular abattis over which the *Tabernaemontana* inclined its white-blossomed limbs lent a really fairy-like charm to the whole. If though up to now only the lovely flank of the little forest had given us a smile, one of its trees that towered close to the village pathway offered a surprise that made all of us at once express astonishment. It was a real giant of a *Bombax globosum* Aubl. and notwithstanding it was but 120 ft. high, its immense branches extended over a space of 129 feet. At twelve inches from the ground, the circumference of the trunk scaled 57 ft., and the breadth of one of its buttresses at the root-neck measured 8¾ feet. The Macusis called the tree Copalye.

76. After we had cut through this interesting little bit of forest filled with wonders of vegetation we saw the basket bee-hive like, dome-shaped houses of the village rising above the lowly *Curatella* and blue-blossomed *Bowdichia.* On entering, we noticed a black figure hurrying towards us:—it was Hamlet who, just arrived, was bringing the news that Mr. Fryer had still been unable to leave poor Petri; having soon recovered from his sham sickness, he had been despatched to reassure us about the former's long absence. Still more gratifying was a quantity of rice that this gentleman had forwarded at the same time by the two Indians who had shown his messenger the road: a gift that, owing to the scarcity prevailing, was doubly welcome.

77. The settlement consisted of seven round dome-shaped houses of 30 to 40 feet diameter and averaging 40 to 50 feet in height. The entrance, the only opening, was closed at night-fall with a sort of door made of palm-leaves. As with other tribes several families occupied a hut, inside of which the occupants were peacefully sequestered without their relative portions being separated off by partition walls. The area assigned to each family was distinguished by some stones, constituting a hearth, and three or four cross-beams, fastened with rope-vine to the upright supporting posts at about seven or eight feet from the ground, upon which were slung the hammocks and where the bows, arrows and blowpipes of the respective house-masters were laid: the latter's hunting trophies were fastened one above the other to the uprights. An enormous hollowed-out tree-trunk painted in Indian style, that served as a bowl in times of festivity and might certainly hold 300 quarts, occupied the central portion of the large houses. The same noble presence that astonished us in Sororeng's companion, likewise characterized the remaining villagers. All were fine, slim people with well-bred peculiar features and large Roman or Greek noses, on account of which they compared to very great advantage with the more mulatto-like type of Warraus, Macusis and Arawaks; not only in their whole physiognomy, but also in general build of body, they generally favoured rather a development towards the North American tribes. The women, who regarded us strangers in naively bashful astonishment, possessed the same quali-

ties except that their vigour and musculature appeared to be much more delicately moulded. I had already enjoyed many an opportunity for admiring the hair of Indian women, but I had never yet seen it in such length and profusion as possessed by the Wapisianas. They generally had it nicely smoothed, tidied up and greased with palm oil: falling over the shoulders, it reached to the calves in many cases. The men almost always cut theirs short. In the perforated nasal septum they (men) wore polished smooth and flattened-out silver or copper coins, and in the perforated under lip either a small cylinder or sort of bell made of bone. In their clothing, the men and women corresponded with other tribes, in that it consisted only of a lap-cloth. There was more difference, however, in their language which had much resemblance to that of the Pauixanas of the Rio Branco: its utterance, and intonation of hard and sharp words reminded me forcibly of Jews.

78. The endemic skin disease that appears to be hereditary amongst the South American tribes, was also indigenous here. As yet we had not found a tribe with which we had come in contact, free from it, while all others of whom we had got to learn, were affected with it.*

79. We were less surprised at Goodall's keen fondness for his art being so fired by the really lovely features and beautiful figures of the women and girls as to want to transfer them instantly to his sketch-book than we were at the infinitely naive maidenly conduct of the originals, who, on account of the ignorance of the actions and scrutinizing gaze of the artist were placed in such embarrassment and restlessness that the blushes which shame called to their cheeks were even noticeable through their brown complexions. After the first upset was overcome, Goodall, as we expected, met with further difficulties, because before he was aware of it the pretty creatures had disappeared and it was only after making many a present that we succeeded in persuading them to submit once more in the presence of their husbands or mothers to the artist's critical contemplation. But still more interesting was it for the observer to follow the inward struggle between natural shame and curiosity. When Goodall looked down on his drawing-paper, the eyeballs of the originals rolled in its direction; but what a shock they received on finding themselves caught on their stealthy errand either by us or by the artist suddenly glancing up! Although the men apparently felt flattered by this portraiture, we could prevail as little upon them as upon the women, to look straight at their own likenesses; their friends on the other hand regarded the pictures with evident interest.

80. Polygamy is also indigenous amongst them, if not as prevalent as it is amongst the Warraus and Arawaks.

81. Judging from the quantity of hunting trophies, which included the dorsal carapaces of several turtle, and the large number of beautiful dogs, the Wapisianas must be as equally passionate of hunting, as they are of smoking. They also roll the tobacco-leaves in the inner bark-

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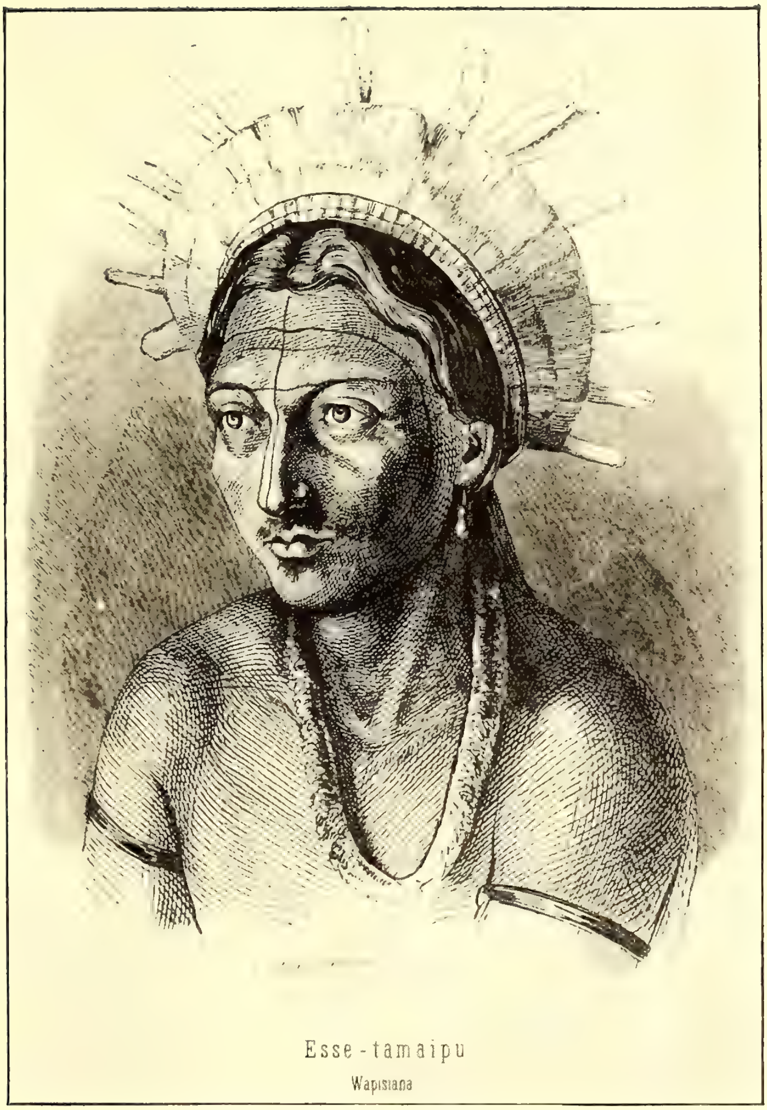
* Probably impetiginous conditions, not hereditary, but due to the uncleanly surroundings (F.G.R).


Esse-tamaipu
Wapisiana

ESSE-TAMAIPU, A WAPISIANA,

sheath of the Kakaralli (*Lecythis ollaria*) and smoke them like cigars: they mostly blow the smoke through the nose.

82. As we wanted to resume our journey onwards on foot, and my brother was anxious to undertake the trigonometrical survey of the junction of the Canuku with the Cursato Range as well as that of the isolated mountain groups through which we were later on to take our course, we spent several days here. I accordingly made use of the opportunity in examining the interesting Tenette Hill more carefully from a botanical point of view. It lay north-west from the village, rose 124 feet above the savannah, its top, except for some miserable *Curatella* bushes, being almost devoid of all vegetation. Before reaching the real summit, I came upon two apparently large platforms covered with considerable granite slabs amongst which a quantity of *Agave*, *Cereus* and *Melocactus* flourished. In very close association with these stone flats *Plumeria*, *Polygala*, especially *P. Timoutou* Aubl. and *P. monticola* Humb. Bonp., *Myrtaceae*, *Melostamaceae* and *Malpighiaceae* sprouted between the granite boulders strewn one over the other in wild disorder. Besides these just mentioned, the luxuriant little forest contained another interesting tree for me that I had indeed seen oftener in the forest-oases extending to the south-ward from Pirara, but had never met with in flower. Our attention had been drawn right at the very outset not only to its beautiful dark orange wood, out of which the Brazilians had mainly built the church and homestead, but particularly also to its curious large-winged seeds. Judging from its flowers it was a new species of *Ormosia*, and received the name of *Ormosia histiophylla* Klotzsch. As the really beautiful timber, very like mahogany, on account of its deep orange colour that almost blends over into a red, takes on a most glorious polish, it would, at all events, if exported, be appreciated as a furniture wood, to which purpose the Brazilians, who call it "Poa da rainka," already apply it. The view from the top was delightful. The picturesque Canuku Range stretched from W.N.W. to E.S.E., while the Saeraeri, 30-40 miles in circumference, visible with its three fairly deep-saddled conical summits, and a number of other isolated hills, rose out of the savannah about 18-20 miles away towards the N.E. The mountains of the Moon, the Kai-irite of the Wapisianas, limited the horizon in the S.W., while in N.N.W. the Mariwette stretched its head into the hazy layers of atmosphere. The Cursato, Ursato, or Cussato as the many tribes call the Range, which rose in the S.E. close to my point of observation, is only of ordinary extent. Its long axis extending from N. to S. amounts to hardly five miles, and its highest point in 2° 47′ lat. N. is not 3,000 feet above the level of the Takutu. Like the Canuku, the Cursato Range is thickly wooded, except that it is devoid of those steep granite cliffs and columns that lend the former such a picturesque and romantic character. Towards the S.E. from Cursato, Mt. Duruau appears: and following it is Mt. Manoa, the contour of which, according to the statement of the Indians, represents the figure of an ant-bear, and hence the name, but I, unfortunately, had to assure my companions that my imagination was too thick and dry to recognise this.

83. Fever had now taken complete hold of me and notified its presence every three days in such a manner, as even to arouse the pity of the village Piai-man who during one of the attacks came of his own accord up to my hammock, blew into my face, kept on muttering some unintelligible words between his lips and then started blowing upon me again. Though the circumstances under which I was labouring were not conducive to make me laugh, the inclination finally reached such a pitch, that I could no longer restrain myself. Insulted and angered, the sympathetic physician turned away, and on the following day, when the fever was still shaking me up, told all his wards that it was my punishment for having ridiculed his yesterday's incantations.

84. The weariness which the troublesome presence of the fever would have otherwise entailed while lying in my hammock, was dissipated by the strange and funny antics of a young ant-bear (*Myrmecophaga jubata* Linn.). Our huntsmen, on the day after our arrival, had brought him home from the savannah, where they had found him in company with his mother, but had managed to secure him before making his escape on her rescuing shoulders. For the first two days he was uncommonly wild, and only rarely ventured from the darkest lurking-place of the house. Should anyone approach, he immediately took up the defensive, but in such a manner that caution was necessary even for the bolder ones. While he squatted and pressed the left fore-foot into the ground, he let out at the disturber so powerfully with his right that every blow with his long hard claws would certainly have torn away a not inconsiderable piece of flesh. Were he attacked from behind, he altered his position as quick as thought, and should it happen to be from all sides he threw himself on his back and hit out with both fore-feet, all the time making an ill-tempered and angry noise that was very like the growling of a little pup. Often enough this was mingled with the loud outcry of the young hunting dogs whose friendly intention of playing with their new companion would be followed by the most piteous sounds from the little stranger. Were he to seize one of them, the latter could only be released with the combined help of several Indians from the deadly embrace in which he clasped the obtrusive offender with his crossed fore-paws. As the ant-bear has neither hole nor habitation wherein to have a sleep, it seems that Nature has supplied him with the long-haired tail as cover from the cooler night and from rain; our little prisoner, at any rate, put it to this use. When he lay down to sleep, he either drew all his four feet together underneath his belly, or else he assumed the position of a sleeping dog, and spread the tail only over his head and fore-part of the body. It was astonishing to me how his entire body always felt ice cold. When quiet reigned in the house, he raised his pointed snout, sniffed a few times in the air around, got up and ran about the place when his trunk-like nozzle almost touched the ground. If he got close to a dog or some other object, he immediately squatted on his hind feet, stuck his nose in the air, sniffed and investigated in all quarters, and then growled and groused until he finally moved off again on his original track. As a result of all my observations, but particularly from the fact that he frequently ran up against articles that stood in his

way, I was plainly convinced that his sense of sight must be uncommonly weak. His growling was never more vexed than when he really did hit against an object. This species must be able to climb equally as well as the smaller ant-eater *Myrmecophaga tetradactyla,* for our prisoner not only undertook excursions on level ground, but also extended them to the house-posts and walls, up which he clambered with the greatest ease. Were he quiet for a while, he suddenly raised himself on his hind legs, like bears do, sniffed around in the air, and then, if he found nothing suspicious, lay down again. A waterish fluid constantly trickled from the snout and nose. It was only extremely rarely that I saw him drink. We fed him with termites which the Indians gathered in the savannah. The rapidity with which he stuck his long sticky tongue into the heap, covered it with insects, and withdrew it, set me wondering as to how so large an animal could satisfy his hunger with such small fry. At the same time that he swallowed the ants he engulfed a large quantity of the building material of the nest. Just as readily as he devoured the termites he gorged fish chopped up fine. My brother, on his previous journey, had for a long time fed the young specimens with the latter. As we intended returning to Tenette after discovering the source of the Takutu, I left my prisoner here to be looked after, with the idea of taking him with me to Pirara and Demerara, and despatching him later on to Berlin. Unfortunately I found him dead on our return: the Indians had probably let him starve.

85. Having denied the ant-bear teeth for weapons, Nature has supplied him with a not less dangerous means of defence in huge claws and extraordinary muscular strength of fore-feet. Even in fighting with the jaguar he will often come off victor, and the Indians assured us that they had not only found the carnivore by itself with ripped-up body, but also both combatants dead at the same time. The hunter will never approach an ant-bear shot with the poisoned arrow until he is convinced of the venom having exercised its full powers.* The female throws annually but one cub which, when a few days old, she carries on her back, whither also, in times of danger, the little chap makes its escape. The youngster accompanies its mother usually for a year, when it is supplanted by a new arrival and is then free to roam.

86. As is known, the ant-bear saunters along on the outer side of the soles of the fore-feet with the claws drawn together underneath; he does not retract them like the cat-tribe, and hence cannot run flat-footed. At the root of the tongue are the two large glands that supply it with the viscid liquid mentioned (Sect. 84). While in a fluid state this secretion is extraordinarily sticky, but when dry it can be rubbed to powder between the fingers.

87. The big house that received us being still occupied by its owners, the observation of their ways and doings supplied me with plenty of variety during my sickness. In their manner of living the Wapisianas differ hardly at all from the other tribes with which I had become

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* See the story of Tiger and Anteater in Roth's Animism and Folk-lore, etc (Ed.)

acquainted. Waking of a morning, the husband got up, stood in front of the door, where he stretched, flexed and rubbed his limbs several times, and then went to a distance to satisfy his natural wants: in this latter respect men and women show extraordinary shame, for it is never performed in the presence of others, and they cover everything up with earth, like cats. This done, he returns to the house, squats at the fire, and without saying one word to his people, tries to keep it going, roasts some fruit or eats the breakfast put before him by the women, and then hurries off either to the chase or goes fishing; in the meantime the women smoothe and anoint their own and children's hair, paint their bodies, and, undertaking other household duties, then hurry off to the field and into the forest to search for fruit: the former, however, owing to the bad harvest, offered them little or nothing. In cotton-spinning they were just as expert as the Macusis.

88. Though the Wapisianas appeared so clean as regards their bodies, each family nevertheless seemed to regard the cleaning of the house as a trouble that it would rather avoid, the dust and dirt having collected in regular heaps. The unpleasantness of the situation was increased by the four or five fires that were never extinguished, while the smoke, seeking in vain an exit through the door, slowly crept towards the vaulted roof in many a complicated spiral: it became so troublesome that my eyes were bathed in a constant flow of tears. To this was still to be added the insufferable barking of the many half-starved dogs that broke out on every occasion when any of our people entered the house, the shrieking of innumerable parrots, as well as of other tame birds, and the numberless swarms of blood-thirsty fleas, for which my presence in the hammock seemed to exercise a special attraction.

89. Several Hokko-hens (*Crax tomentosa*) openly exercised their sovereignty over the other tame poultry, their oppressive sway reducing the fowls, the *Psophia* and *Penelope*, to a state of fear and subjection that was truly ridiculous. It was not enough for the latter to accommodate themselves to their capricious wills by day, but even with incoming night they did not dare perch where the former wanted to roost.

90. The fruits of *Melicocca bijuga* (Macu of the Macusis), *Genipa Marianae* Rich, and *Genipa edulis* Rich, which were just then ripe, had to make up for the want of cassava. That of the first is appreciated in Georgetown, where the tree is cultivated under the name of Marmolada-box; the Wapisianas call it Umpa.

91. There is still another bird here, the *Ibis oxycercus* Spix., the Tah-rong or Tah-rah of the Macusis and Wapisianas, which, like the parrot, proclaims the break of day. Every morning at dawn two pairs of them that had settled in the neighbourhood of the village, struck their shrill protracted rattling note which resembles the syllables Tah-rong. They fly in couples from tree to tree, and the female never leaves the side of her mate: where the latter flies she follows, both returning of an evening at the one time, with the same unpleasant cry, to their resting place, a Mauritia palm. When the male is shot, the hen, like the *Arara*, invariably returns to the spot where she last saw him. The

metallic plumage together with the orange-coloured waxy skin of its bill, and the ring round the eyes, give the bird a lovely appearance. I found this *Ibis* only in the environs of Tenette, and nowhere else.

92. To the south-west of the settlement, not far removed from it, there stretched a considerable swamp, the water of which at a distance was hidden by the thick vegetation, particularly the *Mauritia* in a most flourishing condition. I found trunks here from 100 to 120 feet high up to the spot from where the huge fan-like fronds began to spread. The Wild Plantain of the Colonists (*Ravenala guianensis*) ran the proud palms closely in height: then followed *Cannaceae,* Ferns, and *Zingiberaceae* which were hemmed in at the water side with a flowered border of *Rhynchanthera grandiflora* DeC., *Microlicia bivalvis* DeC., *M. brevifolia* DeC., and (a new species) *M. heterophylla* Klotzsch. Along the swamp edge were numbers of holes which the Indians had excavated with the object of allowing the water necessary for their daily requirements to filter through. Of course this commodity was not to be regarded with critical eye unless one wanted to spoil one's appetite entirely.

93. On the first day of our arrival I had already made an interesting find in the little forest on the hill with a specimen of the beautiful moth, *Noctua* (*Erebus*) *Agrippina*, 10 inches with wings extended, and the only specimen I came across on the whole journey.

94. We were astonished at discovering a salt among the Wapisianas which we learnt on enquiry was obtained in the savannah: it was uncommonly tart. On collecting it the mass is similar to our peat-earth, which only subsequently under repeated washing, takes on a white colour.

95. The Takutu had hitherto rendered our journey so distressing that we would gladly have avoided its help in the transport of our things, but under those circumstances a large portion of our baggage would have to have been left behind in Tenette, because the village no longer sheltered the number of male inhabitants requisite for their removal. Accordingly what was not absolutely necessary was left here.

96. The mean of the thermometrical (Fahr.) observations determined during our stay at Tenette was:—

1842	6 a.m.	9 a.m.	12 noon	3 p.m.	6 p.m.
16th to 23rd April	75.87	79.83	87.63	90.10	81.33

The observations were taken in one of the houses open on all sides, where the thermometer was protected from reflected solar rays.

CHAPTER II.

Departure from Tenette—Bulimus haemastomus—Orthalicus gallinus—O. undatus—"Descimentos" of the Brazilians—Auuru-paru Settlement—Mt. Kuipaiti—Savannah deer—River Curati—Guidiwau—Mt. Wurucokua—River Watuwau—Kai-irite or Mountains of the Moon—Extraordinary granite flats—Tuarutu Range—Pyramid Rock Aikuwe—Waterless mountain defile—River Manatiwau—Tuarutu Village—Hamlet's adventure—Mixture of negro and Indian women—Skin-disease of the Indians—Granite Rocks Uruwai, Wapuna and Curuschiwini—Departure from Tuarutu—Ossotschuni Range—Bertholletia excelsa—Atta cephalotes—Macusi settlement Maripa—The source of the Watuwau—The different species of cat-tribe in Guiana—Ampelis pompadora—Sources of the Takutu: its basin—Ateles paniscus.

97. At break of day on the 23rd of April we left Tenette which is situate in 2° 49′ 40″ Lat. N., and 59° 48′ 29″ Long. W., and lies 13 miles west of Pirara. My shoes through the frequent bathing in the waters of the Takutu, where I did not dare remove them for fear of sting-rays, had got into a state that precluded all further use on a land journey. I had to employ a writing-pad, and that apparently brought me into direct contact with Mother Earth. There was no shoemaker and I accordingly found myself obliged to walk in sandals like the Indians. This determination was more easily resolved upon than carried into effect, because the web of my toes, like the skin and muscle-covering of the tendon Achilles still possessed its German sensibility. The sandals are made from the split leaf-stalks of *Mauritia* and are generally worn by the Indians of the savannahs and of the ranges because the innumerable sharp and pointed quartz fragments that cover both would otherwise cut up and stick into their feet. Upon similar ground surface, a sole like this certainly lasts hardly 2 to 3 days, but then every palm supplies a new one. To fasten it to the feet, there are strings made from *Bromelia karatas* fibre on both sides, which, drawn through between the big and second toes, are slung over the heel and round the leg, and tied together over the instep. At first jogging along with this simple substitute for a shoe was all very well, but then limping soon began, and half an hour later the blood was running between the toes and down the heel, where owing to the continuous friction, the strings had rubbed their way in. As the wounds could never heal, the time taken to form collosities proved to be weeks of real tribulation and martyrdom—but needs must when the devil drives: it was impossible to make a change and I had to bow to the inevitable..

98. After following a South-Westerly course from Tenette over the savannah we reached the mouth of the Cursorari, a small stream, and with it, the Takutu again. Innumerable trees and bushes of the lovely *Elisabetha coccinea* Schomb. overstrewn with their brilliant red flowers closed in and regularly enveloped the banks of the insignificant watercourse. The trees were covered at one and the same time with buds, blos-

soms and pods: it was particularly due to their red velvety carpel that the latter lent the tree an extremely interesting appearance. A small corial that was found here, carried us across the Takutu, to where, opposite the Cursorari, a tiny river ended its course, when we took a more southerly direction towards Mount Auuru-paru, which, tapering out into a spur, rose some distance ahead. On the very savannah that we crossed, flats of scattered *Curatella* and *Bowdichia* continually alternated with thickly-timbered oases. Were one to approach such an oasis, that mostly has a circumference of from 1 to 6, often more, miles, the altered character of the vegetation would indicate its proximity, without it even being yet seen. The isolated *Curatella* and *Bowdichia* trees become more numerous, while here and there a shrub of *Rubiaceae, Compositae,* or *Melastomaceae* mingles itself in amongst them, but still one cannot say whether it is the savannah or forest vegetation that predominates: the doubt is completely dispelled, however, as soon as the *Solanum*, *Apeiba, Helicteres, Mimosa, Bauhinia, Peltogyne, Melastoma, Sauragesia,* and *Wedelia* bordered around with *Agave* and *Cactus,* meet one's gaze, and the cooling atmosphere intimates to the heated skin and dried-up tongue, the presence of the densely leaved *Myrtaceae, Lecythideae, Laurineae, Leguminosae,* and *Euphorbiaceae.* If the flat that such an oasis occupies is swampy, then it is the palm family and *Heliconia* that are in the ascendant. The soil of these oases naturally varies, like its vegetation, completely from that of the savannah, and generally consists of a rich marshy bottom, often also of a hard clay mixed with sand and decayed vegetable matter. In the course of the forenoon we crossed the small river Totowau that flows here into the Takutu from the westward.

99. We made haste to reach the thickly timbered oasis before a dull black thunderstorm that was gathering should burst, but instead of seeing our wishes fulfilled, the sluice-gates of Heaven already commenced to open. The oasis consisted almost only of Palms, *Zingiberaceae, Cannaceae* and *Musaceae,* the leaves of which furnished the grandest covering for our baggage that the Indians had as quickly as possible collected into heaps. Two or three leaves of the *Ravenala guianensis* furnished us with most excellent umbrellas, upon which the rain, pouring down in torrents, made fairly noisy music. The tempest raged for several hours, and however trying the circumstances naturally were, they nevertheless had many a comic side in connection with the silent naked groups who, cuddling up together, their teeth chattering with cold and holding huge leaves aloft, were squatted around. When the rain finally ceased we continued our journey across the oasis in spite of being wetted through and through, and were not a little surprised on emerging from it, to find one of the most pleasant hilly-landscapes stretching away ahead, but the pleasure was sadly marred by a bad attack of fever. From now on the wooded tracts merged more and more towards one another, while the savannah flats diminished. Exhausted, we reached by afternoon a forest, the tropical fulness of which so surprised me, that though I was wearied with the fever, and tortured with the sandals it nevertheless drew my attention from off all my bitterly experienced sufferings. Huge-leaved palms, together with giant

Ravenalas that with their mighty canopied covering shut off every fruitful solar ray from Mother Earth, shaded innumerable *Musaceae, Cannaceae, Piperaceae, Orchidea* and mouldering fungi: with all of them the succulent leaves and stalks, as well as the abnormal colouring gave more or less indication of an avoidance of light in the course of their development. Both on the edge and within the oasis itself I found several examples of the lovely glutton-snail (*Bulimus haemastomus* Lam.) which I never came across again in Guiana. Judging from the purple red border and lip of its shell, it belongs indisputably to one of the most beautiful snails in the Colony. In the oasis I had already ferreted out from the tree-trunks several specimens of *Orthalicus gallina Sultana* Beck., and *O. undatus* Beck. I have met with both species right through British Guiana: the animal of the former was often so big, that it could no longer withdraw into its shell.

100. After continuing on our way for some time through the forest and its wet musty atmosphere, we came upon a fairly extensive cassava field, the welcome manifestation of a settlement that could not be too far off, and which we in fact soon discovered on a small hummock as a dreary spot where fire had taken place. The formerly happy village of five houses had been visited by a Brazilian Descimento (Slave Expedition), surprised at night, and set on fire, with the object of carrying its inhabitants—men and women, old people and youngsters—into slavery. Only one of the 5 buildings was still in a tolerably habitable condition. While with inward indignation in the midst of this obvious testimony of human wickedness, we were regarding all the misery that European Culture had brought to the peaceful hearths of fellow brothers entitled to the same rights as ourselves, and each of us was picturing to himself, from the confusion in which shattered cooking utensils, broken weapons and half-charred firebrands lay scattered around, the scene that only the tranquilly murmuring trees had been witness of, several Macusis came out of the house that still managed to provide shelter from the storm. It was a family from the Rio Branco who wanted to spend the night here, and amongst whom my brother recognised to his great joy two of his former companions on his trip to the sources of the Orinoco. The pleasure over this unexpected meeting was, however, all the greater because on that occasion he had been forced to leave one of them sick unto death at a settlement on the banks of the Kundanama: on recovering, the patient had covered a distance of more than 300 miles by himself to reach his own village again.

101. After we had rested a few hours at this scene of devastation and barbarism, and my brother had presented his old friend with several trifles, we resumed our journey, notwithstanding the lateness of the hour, in order if possible to reach the village that lay, according to what the guide said, at the foot of Auuru-paru: we succeeded in doing so just before sunset. The settlement consisted of a large house with 10 occupants, the majority of them old people: on entering, I came across the oldest Indian woman I have ever seen. Lying undressed in her hammock, her snow-white but still abundant hair covered her crumpled shoulders, though her whole figure was more like a skeleton covered with

loose dependent folds of skin, than that of a really living person. The fearful ugliness which is usually characteristic of old age in tropical climes was so repulsive in this particular case, that I instantly turned back into the open air. Weak as she was, curiosity did not permit of her staying in her hammock, for hardly had I left the house when the walking skeleton, led by an imbecile boy, whom I had not previously noticed, appeared at the entrance and gazed in wonder on the first Paranaghieris who had visited the settlement. The absolutely animal appearance of her companion, from out of whose open mouth the tongue hung over his chin, and the silly fixed vacant look which he bestowed alternately on the old woman and upon us, made the already naturally repulsive figure yet more hideous. My brother, notwithstanding his many years' residence, could only call to mind one other example of such advanced age among the Indians.

102. Imbeciles are treated with special respect and dread, because it is a general conviction that these poor creatures are in intimate relations with the beneficent Spirit, and it is for this reason that their words and actions are regarded as utterances of supernatural significance (Gottheit). Except for one young and pretty woman who smilingly brought us some honey (*mapa*) in a gourd, for which she was presented to her inexpressible delight with some glass beads, all the present inhabitants, as already stated, consisted of old people: Sororeng, however, was soon to root out two more young men who just then happened to be hunting in the neighbouring forest. To notify them that strangers had come onto their property, we fired two shots. The fright which this produced on the reasoning as well as irrational occupants plainly showed us that the weapon with its message was equally unknown to both. The wild shrieking of the old woman, of the imbecile boy, and of the tame parrots, fowls, etc., already roosting on the roof and neighbouring trees, together with the frightened notes of the wild birds rising in troops over the tree-tops, combined to form such an inferno of noise that we were struck with surprise, and believed nothing else than that the whole world around us had gone mad. After half an hour's time we saw both men with troubled faces, come running over the savannah to the house: they probably believed that the shooting meant destruction and murder.

103. The hopes that the luxurious cassava field had raised were at once dispelled by the statement that the roots were not yet ripe and consequently unfit to be made into bread: the numerous savannah deer, however proved a productive source from which to supply the gaps in the provisions. In order therefore to make the balance last for at least a few days, it was decided to spend the morrow here and send the men out hunting at break of dawn. After the friendly young woman had had a long talk with her husband, one of the two men whom our shots had fetched out of the forest, and had shewn him in the most striking fashion her delight at the beads she was holding in front of her, at the same time dropping a clear hint as to the treasures still in our possession, he suddenly made up his mind that she was to bake some cassava for us on

the morrow: but he would have to go and look at the field before making a distinct promise about it.

104. The disagreeable piping and chirruping of millions of Cicadae (*Cicada grossa* and *C. manifera*), enough to split one's ears to pieces, scared us at sunrise out of our deep sleep. While our best hunters, accompanied by the two young men, lost themselves in the savannah scrub, I ventured with Goodall to pay another visit to the Old People's Hospital, and make a more careful inspection round the place than I did yesterday. With the exception of one or two of the old women, who were squatting below the hammocks of their equally old men, where they were keeping the fires burning or warming a small pot with the remains of their yesterday's meal, all were still lying abed. Just as the unexpected sight of the old woman had scared me away yesterday, that of a not very much less aged man almost did the same thing to-day: his abnormally swollen body showed clearly enough that he was afflicted to a considerable degree with dropsy or some other liver-complaint. The imbecile boy who was squatting below the latter's hammock, stared vacantly into the glowing ashes of a small fire and casting his dull but timid gaze upon me, disappeared with the rapidity of a frightened deer into the darkest corner of the dwelling, when the sick man's aged wife who was sitting near him attracted our attention. A newly-plaited broad straw-hat, probably of Brazilian manufacture, that had got here out of its course, by what particular trade-route goodness only knows, was all the more noticeable as my own happened to be in a very bad way. The proposition I made that he should sell it to me was more readily agreed to than Goodall's offer to buy his thick hair-girdle (*Matupa*): this was hanging close to the hat, and by its bulk bore witness to the erstwhile valour and virile courage of the owner. To part with the hat was not even hard on the old man, and our bargain was soon completed. It turned out to be a very different matter, however, with the beloved Matupa, at the sight of which the moribund vital sparks seemed to draw forlorn fuel, and all Goodall's powers of persuasion accordingly proved fruitless. The alteration in the apathetic features of the woman, on seeing the glittering beads caused the would-be buyer to alter his plan and address the spouse, who, dazed with vanity, now tried to convince her husband that she indeed wanted the beads while he had no further use for the Matupa. Still, the parting was too hard, and sadly gazing at the girdle out and in, he shook his head, kept his wife in suspense, and told her to hang it up in its old place: the disappointed woman peevishly did so, at the same time returning Goodall the beads already received. The determined purchaser thereupon added a few other knick-knacks to the beads with the result that the capitulations between man and wife were immediately renewed: these ended by the sick man letting the Matupa be taken down, having it placed in his hand, pressing it to his face, and then giving it to his wife who, absolutely radiant with joy, handed it over to Goodall. Without so much as glancing at the articles which his wife had received and was holding in front of him, the invalid turned on his back, and hid his face in the folds of his hammock.

105. In the course of the forenoon we climbed the bleak top of Kuipaiti, which we had already seen from Tenette. Kuipaiti appears to be the collective term for all hills constituting blocks of ranges covered with but scanty vegetation, because we met this name in connection with a large number of other mountains. The base of the hill consisted of granite and gneiss: a more than 1,000 ft. long stone mound about 50 to 60 feet in height stretched away from its southwesterly slope. The view from the top which belonged to a more recent formation was delightful and much more extensive than that from Tenette. The summit might be about 500 ft. above the savannah. The Mountains of the Moon, the Kai-irite of the Wapisianas, towered up towards the South-West, while the distant Canuku Range stretched like a dark band along the northern horizon that was here and there torn by dark masses of cloud apparently resting on its back, while the Takutu, hemmed in with green bushes and giant trees meandered in thousands of bends through the savannah to our feet and received the waters of the Curati in the South West. After a short absence the hunters who had been sent out returned to camp at the same time as we did: they were heavily laden, seven lovely deer being the magnificent result of their efforts. All hands were now busily occupied. Boucans for smoking were set up over there, the deer were disembowelled and cut up over here: and within scarcely an hour and a half a portion of the booty, that only shortly before was sporting in the grass, had been already devoured. The entrails, but particularly the paunch, seemed a great tit-bit to the Indians, for they always ate these portions first. The women were certainly not too very particular about cleaning them, and their request for us to join them as guests fell upon deaf ears, particularly as we were not without meat when they were enjoying their favourite dish. The Makusis call the savannah deer Waiking, the Colonists Begu. To all appearances it forms the connecting link as it were between two species. It is constantly found alone, very rarely in company and then always only from three to at most five individuals together on the savannah. The female must throw her young in March or April because we found amongst our lot four specimens very advanced in pregnancy: but as I have killed deer in a similar condition during September or October, they must either throw twice a year, or else they are not usually limited to any fixed breeding season. The deer is never present in the forests. As the savannah has but little, or hardly any, scrub along which the hunter can sneak onto the deer, it is extremely interesting to watch him on the chase. As soon as the creature is noticed and bends down to graze, he is on the move, creeps forward like a cat, keeping the animal continually in view, however, and instantly remains as immovable as a statue when it raises its head again. Nothing can tire his patience in approaching to within arrow or gunshot by this means, even should two or three hours be necessary for the purpose, and when about 100 paces close to the inoffensive creature, the call of the buck is imitated by him in the cleverest manner. The deer is all attention, pricks up its ears, stamps its forefeet and, whether or not owing to some deficiency in keenness of sight or scent, it at any rate commences circling round the

hunter in narrower and narrower turns until, when within 20 paces, it falls a sure victim to the gun or more certain arrow. The uninterested spectator must think it something supernatural to see the hunter lying immovable in the grass, and the deer gradually closing in. It never fell to our lot to kill venison in this manner. Besides the species above mentioned, Guiana yet possesses the *Cervus rufus* Ill,: the horn of the male has no branches. It lives isolated in the forest, or comes out into the savannah along the forest borders, the mother leading the white spotted young with her. These deer are specially attacked with gad-flies, their whole body being covered with the larva of the insect, while the wood-bobs (*Ixotes*) prove no less troublesome to them. Our hunters often brought to the house animals with head and neck so absolutely covered with the latter, that its loathsomeness made a meal off the animal impossible. The third species is the *Cervus simplicicornis* ? Ill. which also lives only in the forest and is particularly plentiful on the coast, where of a morning or evening it usually visits the estates bordering on the virgin jungle, and is there shot: its flesh is tasty and is considered a great delicacy in Georgetown. The fourth and smallest species is known under the name of Wilibisiri (*Cervus humilis*?): its home is also in the dense forest.

106. On my way back from Kuipaiti I found in the scrub several interesting beetles, amongst which a stag-horn with long antennae, that carried little black and white tufts, particularly delighted me. Already taking it for a new species which, from the correspondence of the colouring of the tufts with that of the Prussian national colours, I had hoped to call "borussica," it turned out to have been previously figured though not yet described in d'Orbigny's travels under the name of *Cosmisoma formosa*. *Buprestis gigantea* flew in large numbers from tree to tree—it is a beetle specially snared by the Indians because its metallic-glistening wing-covers are used as necklaces and similar decorations. The way in which the timber on the overturned and mouldering trunks was bored to shreds showed that *Passalus* and *Calandra* were abundant here: both are tit-bits with the Indians, who eat them raw.

107. The inspection of the cassava field on the part of the young man could not have been without results because his youthful wife brought us really many cassava cakes in the evening.

108. With early morn we packed our smoked deer in baskets and took our departure. At first we crossed the pathless savannah, but then turned towards Mt. Wurucokua that rose a good distance away to the southward. The savannah became more and more pleasant, the surroundings brighter: the forested mountain-tops bobbed up on all sides close to and ahead of us, till we finally had to wade the river Curati because many did not dare cross on the dizzy passage-way over the natural bridge formed by an overturned tree. In conjunction with the Guidiwau and a short portage, the Curati forms an excellent waterway with the Rio Branco. On the other side of the Curati we traversed a stretch of soft rolling ground which our guides called Wariweh. The burnt ruins of a settlement were prominent on one of these hills, but we could not learn whether this was also the work of the Brazilians.

The height at which the village stood offered a charming view, and from the overturned clay walls, upon which we ate our breakfast and which told us that their occupants had been Makusis, because Wapisianas only build bee-hive shaped houses out of palm-leaves, we noticed that the wooded range of hills extended 1½ miles from N.N.E. to S.S.W. A number of Capsicum bushes, loaded with red and yellow fruits, had escaped the ravages of the fire, and proved a welcome find for our companions.

109. A number of isolated mountains of which Wurucokua and Wayawatiku were the highest faded away towards E.S.E.: these more important elevations were only sparsely forested, but their slopes on the other hand were covered with large quantities of rocky fragments amongst which the tropical winter had rinsed a number of waterways where several small tributaries of the Watuwau had their source. As in the case of Kuipaiti a rubble dam extended from Wurucokua S. 60° E. for about a mile down into the savannah, above which the mountain itself rose some 1,500 feet. After a further march of half an hour, we again came upon a rise formed of hardened clay in which a number of angular fragments were imbedded, its upper surface being covered with huge granite boulders undergoing decomposition.

110. Mt. Piritate constitutes the outpost of the Wurucokua, Wayawatiku and Wakurotte mountain group. Along its eastern slope another group stretches to the southward towards the Tuarutu and Ossotschuni as well as a south-westerly one towards the Kai-irite. Ranges, absolutely corresponding in their formation, like the Pauisette, Rhati, Duruau and Pinighette, ran from North to South at a distance of some 5 miles from the bed on the right bank of the Takutu.

111. In the afternoon we reached a low savannah where we had to wade through a number of swamps, the water and mud of which often reached to above our waists. In these marshes the *Mauritia* forms regular forests that are tenanted by immense swarms of *Araras* and small species of parrot. Though I had often come across such numbers of them and had got my ears split with their irritating noise, the endless charm unfolded by their brilliant plumage when flying along in pairs at an insignificant height, never lost its attraction for me.

112. I do not know for what reason, but it was quite the general thing to find numbers of hummocks in such a morass in the course of which one had always to try and jump from one to the other. But woe to the poor fellow who springs too short—a mud bath up to the arms, or deeper still, is the inevitable result, while the laughter of the whole company enjoying another's misfortune is the reward for his false reckoning or frail powers of jumping. The next thing to attract our attention were whole heaps of deer and jabiru bones, without our being able to account how they got here. Even if one admitted the possibility of some carnivore having chosen this swamp as lurking place, and overpowering the thirsty deer as they came to quench their thirst, it was still not so easy to explain how the jabiru could have been seized unawares. Not far from here, a party of carrion-crows had just settled down to pick

the bones of a deer, while from a neighbouring tree the Vulture King, already crammed with the best of the carcass, looked on in indolent stupidity.

113. The swampy grass flat was here and there broken by small patches of bush, and covered with the white blossoms of *Hippeastrum Solandriflorum* Herb. The flower-stalk was often 30 inches long and usually carried 2 to 3 blossoms 10½in. long and 6 in. wide: as with all *Amaryllidea* the leaves appear only after the flower. Morning and evening they spread a lovely perfume. The Macusis called it Manasero: the Wapisianas, Guatappu. As to orchids, I found the glorious *Epistephium parviflorum* Lindl. and *Cleistes rosea* Lindl. especially in the neighbourhood of the patches of scrub.

114. I was extremely interested in a small owl which I had already noticed for several days past: in its way of living it particularly differed from all other members of the family in that unlike them, it did not commence its predatory work at nightfall, but carried on the business by day. It left the ground but rarely and ducked as soon as it saw us approach, to fly a little way while we passed, and then settle on the ground again, when it always made a piping noise. Only rarely does it come within gun-shot because even at a considerable distance it always keeps its possible enemy in view, and is artful at dodging his gaze. It is the *Strix cunicularia* Linn., the same species met with on the prairies of the western portion of the United States, where it especially enlivens the colonies of prairie dogs: it builds its nest in their lurking holes at the same time living in association with the rattle-snake. From what our Indians told us, it nests out here in the spaces and holes that are often to be seen at the bottom of an ant-hill: the rattle-snake is just as keen on these excavations on account of the animal heat derivable from the myriads of little insect-folk.

115. On resuming our course over the savannah we met these owls to-day in greater numbers than ever. Directly they noticed us, they stretched their necks up, their big eyes glittering in the sun like stars, and then ducked until they believed they recognised a favourable opportunity for flight. The very many goatsuckers which we saw during this day's journey over the savannah likewise played the same trick.

116. The wariness of the goatsucker, which leads the Indians to assert that this bird has another pair of eyes on its back, and the smartness it displayed in frustrating our attempts at catching it, afforded a lot of sport until our attention was once more drawn to something else, the foaming and roaring Watuwau. The river was about 150 yards broad, and derived its name from the identical Wapisiana term for carrion-crow. Although it suffered from the same dearth of water as the Takutu, and hardly reached to our waists, its passage, owing to the uncommonly strong current and numerously scattered granite boulders of all shapes and sizes, was of the most difficult nature, especially for me, because I had just been suddenly attacked with a violent attack of fever and was so thoroughly shaken up that we had to halt some hours on the opposite bank, before I could get along again. The savannah was also here covered with small angular

quartz fragments as well as with larger blocks: this made walking particularly painful for me with my feet wounded by the rubbing of the sandals.

117. On reaching the crest of Aruatimau, a hill about 100 ft. high, also covered with large quartz and granite boulders, the beautiful mountain-panorama of Kai-irite lay in really fairy-like magnificence before us. From the half-moon shaped contour of its ridge, the Wapisianas call the mountain-chain Kai-irite (Kaira, the moon), the Brazilians, Serra da Luna. This supernatural splendour, as in the case of some of the mountain-masses of the Canuku and Pacaraima Ranges, is due to the moisture precipitated on the cold quartz, and to the solar rays reflected at a particular angle, with the result that as soon as the sun reaches a certain height, the crags commence casting their intensely white sparkling lustre a distance of from 30 to 60 miles: nevertheless, as the position of the sun varies, this always happens only at definite times. Thus one of the Pacaraima crags only shines from May to August, because, previously and subsequently the rays do not strike its damp surface at the angle necessary to reflect them to the degree required. The Curassawaka and Quariwaka Crags in the Canuku also possess similar situations where the quartz shines, but the Kai-irite surpasses them all by far. Though situate near the Rio Branco, this mountain range is as little known to the Brazilians as it is to the Indians. The former regard it as the district for the wildest and cruellest Indians, and avoid its neighbourhood for fear of its people: the latter however believe it to be the meeting-place and playground for all evil spirits, and shun its proximity through fear of a bad reception from them. The range extends from N. to S.E., but has no connection with those of the upper Essequibo.. The highest point of the range rises to 3,100 feet.

118. When the trigonometrical measurements were completed, we climbed down the hill and stepped upon a narrow forested mountain valley the right hand side of which was formed of a 900-ft. high pyramidal mountain, called Aruatintiku (Tiger Mountain) by the Wapisianas. In spite of our companions' assertions that many a jaguar must be lurking here, we pitched tent at its foot, for we were more tired and thirsty than we had ever been since the Mahu. The mountain is timbered up to the top, from which a bare pointed crag yet rises above the dark mass of foliage. The hills on the left are only of moderate height.

119. Some small hollows filled with thick bluish milky water were insufficient to quench our thirst or fill the pots for boiling. Fortunately, the Indians found several *Melicocca* trees, the fruits of which supplied what the cavities denied. A furious storm that broke about midnight in the S.W. blustered with such force and fury through the narrow valley, that we were momentarily afraid of being struck by some uprooted tree. Thirst drove us out of our hammocks already before daybreak and started us on the day's trip. The way soon led over the Tahaitiku, detached groups of hills that form a fairly regular semi-circle, and are connected with the western spur of the Aruatintiku. Here also the bases of the isolated eminences were thickly timbered, while their tips ended in rugged and bleak rocky pinnacles. A beautiful blossoming tree-like *Cassia* lent

the valley forestation an uncommonly lovely and varied colour. Soon afterwards the savannah became more stony, the scattered quartz and granite boulders gradually increased in height and circumference, and developed finally into regular rocks until intersected by Muruwit, the small mountain chain, with turret-like or columnar craggy tops that rises independently in the savannah. The most westerly of this chain, over which our road led, is a solid piece of granite from 4 to 500 feet high: the Wapisianas called it, like all bare mountain-tops, Kuipaiti. The gigantic crag, with perpendicular cliffs on its three sides, and a quantity of *Cereus, Melocactus, Agave, Tillandsia* and *Orchidea,* especially *Epidendrum, Monachanthus, Cyrtopodium Andersonii* and individual *Gesneria,* which found sufficient nourishment in the rocky clefts, constituted a truly marvellous picture: owing to a regularly encircling palisade of huge grey *Cereus* surrounding the base of the dark stony mass it assumed an extremely characteristic appearance. This barricade only beautified itself at night in holiday attire with its lovely fairy-like white blossoms, often a foot long, but which then filled the entire atmosphere with their scent, only to close and never again to open before the sun had completed the first quarter of its course. It was solely the beautiful red apple-like fruit that broke somewhat the sombre monotony of this abatis, and offered our parched palates the relief that otherwise one might have sought the neighbourhood in vain for, because its presence is considered the surest sign of a completely waterless surrounding. As my brother was anxious to climb the top from the only accessible side for the purpose of some measurements, we others hurried on beforehand in the direction of a thick scrub rising out of the open plain on the horizon: water must be there. The scorching heat had so increased our longing for a drop of the fluid element, that the prospect of its discovery in that dark bush, hardly permitted my taking note of the lovely blue carpet which the dainty *Xiris americana* Aubl. in this and that spot spread over the savannah: here and there was a change of white patches in the luxuriant blue flats which almost promised us with certainty the fulfilment of our hopes, although it was several times upset by other tracts that were regularly plastered over with a-half to two-foot high granite slabs. Although the *Xiris* could not make me stop in the race for the tempting bush, I nevertheless remained standing astonished at the first of these curious natural pavements, which spread over an area about 200 feet wide. Without one piece lying over another, the eye gazed upon a complete stone floor, where slab was laid to slab, in between which here luxuriant *Rhexia* and *Melastoma,* and there *Clusia, Euphorbia, Peperomia, Gesneria* or *Tillandsia* formed a regular, though in their mesh, an irregular, network. Where these intervals happened to be somewhat larger we were faced by innumerable *Melocactus* with their fearful long "pimplers" and ashen grey upper surfaces, surrounded by their innumerable progeny: and yet our burning thirst irresistibly drove us on to the dark scrub, and I was moreover suffering from a raging attack of fever. It was no good staying here. Ruled by this one thought, I was paying no attention to the pathway, when a pain in the sole of my foot, that seemed to pierce the very marrow and forced me to give a shriek, suddenly checked our haste. I had trodden on a *Melocactus,* the three-inch long spines of which had stuck into my foot through the sandal, and had broken off there. Supported on the shoulders of a couple of Indians I limped, bleeding, to the scrub where we not only found our hopes fulfilled but where I managed to get the broken-off prickle-ends cut out and have the wounds washed. The burning pain in the foot together with a recrudescence of the fever, twice as bad as before, forced me to sling my hammock in the shade between two trees, so as to pull myself together a bit before my brother's arrival. In the meantime he had found a pretty *Helicteres* on the top of Kuipaiti: it was a new species, *Helicteres glaber* Schomb.

120. What with my thirst, the bout of fever, and pain in the sole of my foot, I was so weakened that I could hardly jog along when we resumed our journey to-day, and it was rather a case of being dragged than going by myself. Added to this was the troublesome charcoal dust from the burning savannah which the Indians can never omit firing when they leave a rendezvous. The sea of flame, strongly fanned by an easterly wind, was being driven ahead in the direction we had to follow: a dense cluster of forest far afield had barred its further progress which was recognised from the fixed columns of smoke that rose from its edges.

121. After crossing the oasis, and a small stream meandering through it in thousands of bends, we once more came upon the open savannah and at the same time onto a practically continuous marshy soil where the abundance of water proved almost as tormenting as the scarcity of it had done in the fore-noon. Swamp followed swamp, and all to be waded when the water would often reach up to our arms. On such occasions the hardened fitness of our Indians took us completely by surprise. When after meeting with a longer and drier interval, we again met with swampy spots, it was a case of our companions just wading in and through the water without a stop, dripping with perspiration under the weight of their loads. Had we, after every crossing, wanted to change our truly simple clothing which consisted of but a shirt and linen trousers, we should have required another wardrobe than what we carried with us.

122. The dead silence that reigned, not only among our party, but also over the whole surroundings, was suddenly interrupted by a loud and distant barking: it came from a wooded hill on the slope of which rose an irregular mass of granite, but our eyes were unable to discover its source. As our companions rightly concluded that where dogs barked, men must also be present, they commenced shouting: everything remained silent and nothing living let itself be seen. The vanguard doubled their pace, climbed the crag and made their way through a thick border of *Agave vivipara* which had forced its candelabrum-like flower-stalks high into the air, and closely adjoined the brushwood, when the foremost of them soon discovered an old Indian on a rocky bank between the Agaves. He was carrying a bow and arrow in his hand, and watched our movements with indifference. After exchanging a few words with our Indians he turned in the direction of a dense scrub when—after calling in a loud voice—the brushwood parted and there came into view a frail young woman leading a pretty boy by the hand; she was followed,

not long after, by a powerful young Indian, also armed with bow and arrows, and several beautiful dogs accompanying him.

123. The hunting party had already recognised us a long way off but owing to our wearing large straw hats, had taken us for Brazilians: realising that their presence had been betrayed by the irrepressible barking of the dogs, the young couple, together with their boy, had withdrawn to a safe hiding-place. The old man, whose great age protected him from slavery, remained behind to prevent, by his presence, the supposed man-hunters making a more diligent search of the forest, or if necessary to signal those in hiding to take further flight.

124. They had come from Tuarutu village, the provisional end of our journey, situate in the similarly named ranges now not so very far distant, where deer are not to be found: they had extended their trip to hunt these animals in the savannah up here. They had left their village three days before.

125. A terrible thunderstorm that burst over our heads about midnight with such fury that any more sleep was absolutely out of the question, unfortunately broke the rest that we had all longed for after so tiring a march. The rain poured down in such torrents upon our tent that although we had spread it under densely leaved trees, the thickly oiled cover could not stand the strain. All the elements were in an uproar: the unfettered tempest blustered and flustered through the encompassing forest where its angered howl was every now and again deadened by the bursting of the claps of thunder or by the dull boom of some giant tree crashing to earth in the near or remote distance. It was this that made us shudder inwardly, because, owing to the truly Egyptian darkness which was only momentarily cleft by a flash of lightning, we were constantly afraid of one of the huge trees close by being uprooted, and crushing us the next instant under its weight. However strained the effort was to remain in our hammocks during this upheaval of the elements, this absolutely passive resolution was nevertheless the only means of escaping the dangers everywhere threatening, at least in so far that they did not strike the little spot that we actually occupied. The poor Indians, who had made no provision for such weather, were far worse off than ourselves, because, not having built any temporary huts, they had just slung their hammocks between the trees, from which the raging storm had driven them under our tent where, packed like herrings, resting on their heels, their teeth clattering with cold, they squatted on the ground, to be brilliantly illumined by the lightning at one moment, and to disappear out of sight the next.

126. Finally came the morning that we had long anxiously awaited, and all measures were immediately taken for resuming the journey: the Indian family had already left unnoticed, for we sought them in vain at break of day, and were consequently forced, without their guidance, to wade through the low-lying savannah which the violent downpour of rain had changed into a regular lake. With the cool temperature of the early morning the more than two-hour long passage across, during which the water often came over our knees, was far from pleasant. Except for a new species of *Oncidium* which, with its yellow blossom-

stalks showed up above the surface in isolated places, the low-lying vegetation was completely covered.

127. Soon after getting over the watery savannah, we entered the wooded Tuarutu Range just as we struck a small defile leading to the dense virgin forest in between mountains from 4 to 500ft. high, which in the distance were overtopped by a still higher chain. The path became more and more stony and impassable until it finally disappeared altogether, when it came into view again on some small stony patches of savannah which, from now onwards, alternated with the thick primeval forest, almost without a break.

128. Our negroes and mulattoes received the strictest orders to keep more together and particularly with the advance guard of the procession, because in between the craggy remnants and through the trackless forest, it was only too easy to lose one's way. In many places we had finally to employ hands as well as feet at one and the same time to get over the granite boulders that often formed regular zones and barricades. It was the wildest and most romantic scenery I had yet seen: a landscape of infinite charm, which in its constant change from phantastic rocky ridges, that towered here over the rank foliage like cyclopean buildings, to the loveliest meadow valleys, fixed one's attention with some supernatural influence. The brown figures with their loads climbed the sombre masses like ants: they vanished now between the crevices and fissures, to reappear soon after like miners out of a shaft. At last a huge pyramid that at a distance of about two miles on our left rose far and away above its surroundings attracted the notice of every member of our party; the Wapisianas called it Aikuwe, and my brother imagined himself transported close to the banks of the Quitaro where an exactly similarly shaped rocky crag, the Ataraipu (Devil's Rock) gazes grim and gloomy over its foaming and cataract-broken waters. The forest, which intersected the wild stretches of savannah, grew finally so thick that even the scorching rays of the mid-day sun proved incapable of penetrating the tree-tops that were so tightly interlaced in, and bound up with, one another by vine-rope. While a lesser quantity of rocky chips —angular, sharp, and pointed—made the path easier to tread, it was covered instead with huge tree-roots which by continually being knocked up against, only caused my sandal-strings to cut deeper into the interdigital spaces, so that with every fresh blow the pain caused me to make a most deceptive spring and raise a scream. What would I have given if by some magic I could have raised a pair of shoes or boots, or something at least that would have enabled my limbs to accustom themselves to the stilt-like pace of the Indians. With these generally prosaic obstacles, were yet associated here and there the barricades of up-rooted trees, which yesterday's and previous storms had heaped atop of one another, as well as the huge beds of dried pimpler-palm fronds (*Astrocaryum*, *Bactris*), the spines of which I felt at every step, with the result that my feet also got wounded elsewhere than on the heels. For the first time, the Indians were the object of my envy: the brown figures slipped between the trees and over all these obstructions like shadows, without the blood running off their feet, or getting their hands and arms torn

like mine. So as to keep, if not in sight, at least within sound of these fleet-footed guides, we signalled a lusty shout from time to time: this continued to be answered from front and behind, till the replies of the stragglers, dying away in almost inaudible tones, proved to us that the orders given to the negroes and mulattoes had not been obeyed.

129. After following up the long narrow pass for a while we again climbed a hill, the slopes of which were covered with a still greater number, if that were possible, of huge granite boulders, between and over which we continued our way in a serpentine course. Many of these boulders were decked with *Orchidea, Agave,* and *Cactus,* but most frequently with *Cyrtopodium Andersonii, Schomburgkia marginata, Cattleya superba, Maxillaria, Brassavola* and *Vanilla.* I had never seen the *Cattleya* again since the Rupununi. Bushes of *Cassia* and *Eugenia* had shot up wherever a little vegetable-mould had collected: they apparently seemed to grow out of the mass of stone. On reaching the summit, there opened out once more at our feet a stony stretch of savannah, at the end of which rose a giant *Ficus* that spread its huge horizontal limbs far into the space around: these were sustained by innumerable supports formed from its aerial roots which, after reaching down to earth around the whole circumference of its foliaged roof, had here taken root again. Though the leafy covering, already from a distance, gives this immense tree with its supports—in which it mostly resembles the Banyan (*Ficus indica*) of Ceylon—a naturally very characteristic appearance, it was the case here to a still more marked degree, because immediately behind it there towered a huge mass of granite which, perhaps 1½ miles in circumference, rose at least to a height of 300 feet: and over this we had to go. Upon the many scattered boulders under the cooling shade of the *Ficus* we gave our tired limbs the rest of which they stood so much in need; at the same time, before climbing this stone-wall, we had to await the stragglers at least till they reached the ridge of the hill behind, where we saw them by little and little, one at a time, clumsily bobbing up into view.

130. If climbing up the huge rocky mass called for unusual care, quite three times as much was required in slithering down, for only by that term could one describe its descent on the opposite side. *Cereus, Melocactus, Agave* and here and there the low bush of *Desmanthus,* as well as several *Clusia* and *Cassia* bedecked the hill. Arrived at the base of its opposite edge we found ourselves once more in a new basin surrounded by crags and rocks, over which our guides, who took the direction from individual rocky summits and ridges, led the way partly through small dense woodland, partly across considerable stretches of savannah. It was only these open savannahs that afforded us a panoramic view of our wildly romantic surroundings. I have never since met with more bizarre rocky masses, nor again with valleys or hills that could in the slightest degree compare with those included in our journey of to-day. Though on previous occasions I had perforce smiled at the wealth of imagination displayed by the Indians, and bewailed my northern materi-

alism, when they pointed out a human being in this rock here, and some animal or other in that one there, I nevertheless now fancied that I had been transported to a veritable fairyland where the world turned into stone was passionately awaiting the wizard's wand for deliverance so as to resume undisturbed once more the active life that a mysterious spell had brought to a sudden stop. The summits of the collective circle of hills ran out into bleak masses of granite, gneiss, and quartz, of the most peculiar shapes, whilst the quartz, on account of the reflected solar rays over the dark foliage of the valley, shed a lustre that only increased the illusion still further. It was not long before the thought of losing oneself in this rocky labyrinth gave me an uncanny shudder, and yet one of our negroes, the silliest of them all, Hamlet, was already finding himself in this awful plight.

131. Since leaving the savannah lake we had not seen another drop of water, though to be sure the rocks and sunbeams had raised our thirst to fainting-pitch. Added to my troubles, a violent attack of fever forced us to halt, the Indians being in the meantime instructed to disperse over the neighbourhood and find if they could some swamp or babbling brook. With how intense a longing I especially watched for each of these scouts to step out of the brushwood can only be appreciated by one who knows what it is to suffer from "intermittent" to a very high degree, and yearns in vain for a drink wherewith to cool his absolutely parched mouth and gums, after a journey of six hours' duration over red-hot rock and under a scorching sun . But one after another returned without having found a drop. Some at least of the panting stragglers now put in an appearance, and, like ourselves, anxiously awaited the return of the remaining Indians who had been sent out to explore,—but these brought with them nothing but some ripe fruits of the Cucurit palm (*Maximilia regia*). This certainly possesses a somewhat sweetish sap, but gives rise to an unpleasant itching which, soon after eating, only still further increases the pangs of thirst and yet we ate them so as just to moisten the panting leaden tongue and dried-up mouth.

132. Although the full complement of negroes, as well as of the others, was always wanting, we still had no real cause for alarm, and as the waiting only prolonged our agony, we once more silently jogged along. The forest that we now traversed ever became more dense, the trees more gigantic, and soon the many deep sighs that spread from the foremost man to the next, and so on, showed that we had again reached the dried-up bed of a torrent. Directly we knew that water had previously been present here, we scattered ourselves above and below the bed, to find perhaps a little moisture still left in some rocky recess: but the signal agreed upon was never forthcoming, and as one after the other came back, the slow rustle of the foliage scattered in the channel over which each one trod, notified those of us who, owing to failing strength, were the first to return to the starting point, that they also had not been successful. After several vainless repetitions of these trips we despaired of the river beds that were to follow. I did not care what happened now: how the Indians in this forest could follow the direction of our track, had no interest for me. With blunted senses and no will of my own I stag-

gered along behind the man in front, dominated with but the one and only idea of recognising the word "Tuna (Water)" in every unusual sound.

133. And yet this lethargy was to be suddenly dispelled in a rather unpleasant manner. The path having become more and more impassable and blocked, the Indians who happened to be in front were obliged from now onwards to clear away with axe and cutlass so much as would allow of those behind creeping their way through. Several sudden cries of pain, a dull buzzing in my ears, and the complete scattering of the procession strained my relaxed senses to the extent of letting me convince myself of the reason for the mad rush, as well as for taking part in it. While the brushwood was being cut, several nests, the size of one's head, of a large wasp (*Marimbonta*), had fallen to the ground: their occupants, now really furious, were dropping upon and following us. Wildly screaming, and down-turned faces covered with their hands, the Indians vanished into the scrub, but the oft repeated yells of distress indicated plainly enough that many had been overtaken by the angered creatures, as was proved by the thickly-swollen faces when the pursuit was over. To avoid such a wasps' nest even the Indian does not shun making a considerable circuit.

134. A number of paths through the thicket suddenly revived our hopes afresh. Men must be living in the neighbourhood, streams must be close by: for otherwise, why so many roads to cross ours in all directions? The earnest warning of the Indians striding ahead, not to take any of these misleading tracks, but always to follow the man ahead, again destroyed our sanguine spirits—they were the pads of tapirs and bush-hogs. The deception was all the more pardonable for us Europeans because the hard ground allowed of no actual impression, and it was really only the practised eye of an Indian that could differentiate between such a pad and the right road. Woe be to him who follows these misleading tracks: he may travel for days, for weeks, without meeting a house or human being, unless hunger and thirst kill him beforehand.

135. We might have thus covered a stretch of about a mile in the impenetrable forest, when I heard a distant voice—I stood rooted to the spot, and listened,—when the words "Tuna, Tuna," struck my anxiously attentive ear. Delighted and overjoyed, I repeated them in as loud a voice as was left to me, and rushing ahead as fast as possible to the object of our desire, I soon stood with truly feverish excitement in the bed of the small stream Manatiwau where certainly no running water, but several darkly coloured pools were to be seen. What worried me, what worried all of us, were the swarms of frogs which, with their fore-feet leisurely outstretched, were swimming about on the surface and, frightened by the noise, were ducking down into the swampy bottom where they dug themselves into the mud, and puddled the water still worse than it naturally was. To us, the water was as nectar in which we rapturously dipped our cassava to take the first bite for the day, because the tormenting thirst, dried mouth, and parched gums had rendered the swallowing of dry bread impossible. It was a feast for the gods, during the enjoyment of which all the worries and troubles that we had endured,

and all remembrance of the sufferings that we had overcome were forgotten, while the possibility that perhaps next day similar anxieties might be awaiting us, lay still further from our thoughts. We could find no better place to await the stragglers. Hardly had these noticed our happy contented faces, than they received a new hold on life, hurried up in quick time, and after stilling their greed, camped close at hand with similar satisfaction. The Indians threw down their loads, and in spite of our remonstrances jumped into the middle of the pool, both feet together, so as to secure, in addition to the quenching of their thirst, a refreshing bath for their burning limbs, in consequence of which the water became certainly more muddy for those who were to follow.

136. The little stream Manatiwau during the rainy season pours its waters into the Warimiwau, this in turn falling into the Takutu. After taking a rest of at least a couple of hours, during which several of the stragglers had pulled up to us, we found Hendrick, Hamlet and two Indians still missing: but as both the former were known to be the worst walkers, we thought they must have prevailed upon the Indians by means of some promise or other to lag behind and show them the way, as had already several times proved to be the case, when they would often arrive in camp several hours after us. We accordingly took our departure with a view to reaching, if possible, Tuarutu which must still be an hour distant: we left Sororeng behind to wait for the belated ones and inform them to that effect.

137. After we had once more come up to and crossed the open hilly savannah which was likewise enclosed here by mountains and thick forest, we again climbed one of the hills, the sides and summit of which were regularly covered with quartz and granite fragments as well as with a quantity of brown iron-stone in sizes varying from small to coarse shot-grains, comparable with bean-ore. We had not yet come across this form of brown iron-stone in such quantity. Next to these small fragments came huge boulders of a grained quartz which on the outside were coloured a deep red by the ferruginous clay just as we had previously met it in the form of hardened concretions on the savannahs of the Mahu. But what gave us still greater pleasure to-day was the sight of the two big houses of Tuarutu that from the top of this hill we recognised on a second one ahead: we were not long in reaching them.

138. The mostly-aged occupants of both houses had already been informed of our coming by the family that had gone off beforehand, and received us with the far from comforting yet frank acknowledgment that we could only get a few supplies here as they themselves were also almost suffering from want, but that things might prove better in the neighbouring settlements.

139. As our stock of provisions had come to an end, the gaps had to be again filled, and a few days to be spent here. A small dale with a wooded oasis, not far from both houses, was chosen for our camp, and we had just pitched our tents when Hendrick arrived with the two Indians, but without Hamlet, whom they thought had already reached here. From what he told us it appeared that Hamlet must have lost himself in the forest behind the solid mass of granite, probably on one of the tapir or

bush-hog pads (Sect. 134). Hendrick had already early in the day sprained his foot by striking it against the root of a tree, and although thereby forced to take repeated rest, had kept up the pace with us so far as the pain possibly permitted. But the climbing of the huge rock had so exhausted him and increased his sufferings that he was obliged to take a long spell on the platform where Hamlet with the two Indians pulled up. Hendrick asked the latter to remain with him, which they did, while Hamlet expressed his intention of proceeding slowly on, as otherwise he might reach camp too late to prepare the supper. Hendrick followed after a while with the two Indians and reached the Manatiwau to find Sororeng who enquired for Hamlet: then only did Hendrick remember having heard a voice calling a little before dark which sounded to him just like that of a human being, but according to what the Indians told him, belonged to some animal or bird. Nothing further could be done that evening.

140. At break of day (April 28th) Sororeng, without Hamlet, came in from the banks of the Manatiwau: he maintained that the lost one must be miles away from us, because otherwise he would have heard and followed the shots Sororeng had fired all the night through. Everybody was now summoned to go search for the unfortunate fellow, and after much persuasion, coupled with the promise of several glasses of rum, we finally succeeded in prevailing upon ten of the Indians to stifle their antipathy to the negro—whom, convinced of his having been long ago devoured by a jaguar, they were of opinion there was no necessity for further worrying over—and to take their departure with Stöckle in the lead. The latter received strict orders to fire a gun every quarter of an hour, and midst laughter and shaking of heads they made a start.

141. The news of our arrival had spread over the neighbourhood just as quickly as had been the case in other places, for already in the course of the forenoon a long file of Indians moved up to our camp to interview and greet the first white people who had visited the district. Heading the procession strode a tall figure whose body, with the exception of the abundantly painted legs and arms, was wrapped in a piece of coloured cotton which, through goodness only knows what channel, had been driven out of its course here in the way of trade. The hair was combed back and a mass of roucou pasted over the forehead, into which was stuck the white down of the hokko hen. Following him and carrying a sort of stool, came another dressed-up Indian with whom was associated a whole host of others, their bodies thickly painted all over, and then the women who brought up the train. On arriving at our tent, the chief commenced his salutation ceremony which as usual consisted of his moving the flat hand three times up and down close to our faces without touching them, and on its completion gravely took his seat upon the stool that in the meantime had been placed in position, and listened to the accounts which the others brought him concerning our business: for he seemed to consider it beneath his dignity to become personally acquainted with us and our belongings. The description of objects that were beyond the intelligence of these primitive people, and that had been seen to-day for the first time, appeared to be somewhat perplexing. At

any rate, the chief's countenance assumed a vexed character, the conversation became more animated, the reporters were obliged to return again and again to the article, and re-examine it carefully with a view to supplying a more accurate account:—finally it appeared that either his patience had come to an end or else his curiosity had been so aroused by what he had been told that he could no longer keep his seat. He got up and subjected everything, particularly the cooking apparatus which we had set up in a special kitchen, to his own personal scrutiny, and when Sororeng explained its use to him his astonishment reached its limit. Our forks also proved a source of great surprise, which was still further increased when Sororeng demonstrated their practical use. During the course of the day this party of people was followed by yet others, who also reviewed every single article in detail. Amongst the last to come our attention was particularly drawn, especially on account of his peculiar growth of hair, to a half-Indian (*Capoucre*) whose father was Negro, and mother Indian. The hair had taken on half the character of the father and half that of the mother, and consequently had reached neither the complete curled woolly hair of the negro, nor the smooth one of the Indian, but rose stiff in the air, half curled and half straight, and gave the head in addition to its prodigious size, an extremely striking appearance. As regards build of body, the half-breed had the advantage over the Indian not only in thickness and size, but especially in a more compact, more powerful musculature: his colour was a mixture of brown and black. In British Guiana we only met a few of such individuals: they must be all the more numerous in Surinam where the runaway slaves have repeatedly married with Carib women.

142. We found the lichen-like skin-disease indigenous also among the Wapisianas and in those who were present we saw several troubled with it to a fairly great extent. In isolated cases not only the breast and face, but even the extremities were covered with white scaly lichens, which gave them an extremely curious, in a way repulsive appearance: if I might use the expression, the disease looked like mould turned upside down. According to all the information gleaned, it is the skin of the Indians that seems to be the organ most sensitive and liable to catch most diseases. My brother also discovered here an old acquaintance from Fort Sao Joaquim, whom he had met there as a slave in 1837, but who had subsequently and successfully seized a favourable opportunity for escape.

143. Late in the evening Stöckle returned to camp with his party but no Hamlet, without, as we well discovered, having made much of a search for him. The Indians, who knew Stöckle's firmness of character, after fairly quickly convincing him that the negro must have been long ago torn to pieces by a jaguar, had then peacefully laid down to sleep away the time till evening.

144. Through this unpardonable neglect our anxiety over the poor wretch naturally continued to increase, and every effort was now required to save him, if that were still possible. Accordingly, for the night, large heaps of wood were piled up on the hill-top and set fire to, so that Hamlet's attention, were he still alive, might be

attracted to the light that was spreading far and wide. A thunderstorm having again burst at midnight, all the Indians in the neighbourhood were summoned next morning to lend us assistance in our search for the wanderer who was probably already half dead with terror. The promises we made, for only then did they show themselves ready to help search for the Negro, gathered some 20 around; with the result that, including our own people, we now formed a crowd of 30 men, divided into three parties: one of them, my brother leading, returned the way we came, another, accompanied by Mr. Goodall, took a path more to the northward, while I, with the third, struck a line in a southerly direction. It was arranged that we were to continue firing a shot at short intervals so as to draw Hamlet's attention to the help that was approaching.

145. The two other parties were soon lost to sight, and the sound of the firing became weaker and weaker until it finally faded away altogether. With their nodding and laughing my Indians meant to infer that the Negro was not even worth the powder, that would be better spent in hunting tapir, hokko hens, etc: indeed, there were times when I had to exert every effort of persuasion and the whole of my energies to prevent them turning back. This general detestation of the Negro by the Indians is remarkable, especially as it is not limited to particular localities, but is said to be spread in an equal degree throughout Brazil, Chili, and Peru.

146. After wading across swamps, creeping through brushwood, climbing up hill and down dale, scrambling over rocks, and neglecting nothing that could let the lost man know that we were trying our best, I found myself forced about sundown, when I was again attacked with a sharp bout of fever, to turn back. However stubborn the Indians showed themselves to be, they nevertheless applied their entire acumen later on, in learning whether the tracks discovered,—they were certainly quite unnoticeable by me—belonged to Hamlet, *i.e.*, to those of a Negro: "Here's the footprint of an Indian; this is an Indian woman's; one who did not belong to our village passed along here"—yet the words so keenly awaited, "This is the Negro's" were never uttered. The discernment of the Indians in picking up foot-tracks indeed borders upon the marvellous. In damp grass I could have made a bet that I would distinguish the footprints of a European, a Negro, and an Indian from one another, but to be able to recognise and classify them even upon rocks seemed to me to be almost second-sight.

147. It was fairly dark by now when we got back to camp, where we found Mr. Goodall already arrived without his having discovered the slightest trace of the wanderer. Half an hour later a loud noise indicated the return of the third, but at the same time successful, party. My brother, about six miles back, had found the poor devil in a most pitiable condition. The former had given up all hope of success, and was about making again for the settlement when one of the Indians heard a distant call, which they followed and so found tracks and Hamlet as well. Fright and exhaustion had worked such a powerful effect upon him that my brother at first thought he had gone mad, his absolutely incoherent phrases rapidly alternating with intense crying and most

extravagant laughter. When they met him he was carrying a half-eaten land-tortoise on his shoulders, hitherto his greatest antipathy, so as probably to keep the remainder for his next meal. How often, when dishing up a tortoise, had he solemnly assured us that he would rather die of starvation, than eat a particle of the flesh, but up to then he had not learnt from experience the old adage that Necessity knows no law: and yet she had even forced him to eat the hated meat raw. Being still too weak to-day to return to camp with the party, several of the people were left behind to bring him into the village next morning.

148. When he did arrive on the following day, I was terribly shocked at his appearance. In the trembling, ever momentarily startled, corpse-like figure that could hardly stand without support, and with its wildly troubled looks, Hamlet, the ever smirking Hamlet, was no longer to be recognised: the distress that had been retained up to yesterday was still noticeable, and it was only on the day after when his naturally weak mind had recovered somewhat of its balance, that he told us bit by bit the story of his sufferings. After passing Hendrick and the two Indians, he had gone into the forest, and continued following what appeared to be the right track until, struck by the deep silence, he wondered why he had not caught up with any of those ahead. He stopped where he was to wait for the rear-guard, but this never came—he turned back to go and meet them, but they were not to be found. And when at last, towards evening, he struck the rock without discovering even a trace of those he had left there, he was forced to the awful conclusion that he was lost: every call for help remained unheeded. Fear of wild animals and evil spirits, whose victim he already felt himself doomed to be, robbed him of the last vestiges of sense, and yelling wildly, he had broken through the brush and underwood and finally reached the original starting-place again. It was only on the second day that he had experienced a nagging hunger which he stilled with mushrooms until, in the course of his circling peregrinations, he discovered the tortoise. He had not had a wink of sleep for three days and two nights, and on the last one had prayed to his dead mother's ghost to save him. On the second day he had certainly heard the shooting and had run in the direction indicated when the signals suddenly ceased—Stöckle and company had settled down to sleep—and he had given himself up as hopelessly lost until, on the third day, the renewed firing acquainted him that people were still on the search. He had now gathered all his strength for one supreme effort, had hurried towards the spot where the shots were fired, and too exhausted to proceed further had then by calling and shouting, given signs of his existence, when he was fortunately found.

149. Owing to his weakened physical condition it was out of the question for him to accompany us on the remainder of the journey. In spite, however, of our solemn assurance to pick him up again on our return from the sources of the Takutu, his fright had been strung to such a pitch, that our sympathetic suggestions had to be substituted by peremptory orders before he would submit to his terrible fate, for that was the light in which he regarded his having to stay behind.

150. Tuarutu village lay in 2° 7′ 3″ Lat. N. and 59° 46′ Long. W.: the highest point of the range of the same name, in which we now found ourselves, rose 1,800 feet over the Takutu. Some other important mountains in the neighbourhood reached a height of 1,000 to 1,150 feet. The chain stretches to a length of close upon 10 miles without, however, forming a linear range: it consists rather of an irregular mass of isolated mountains and hills encircling larger savannah flats thet are generally strewn with rough granite fragments. Through such savannah flats and scattered elevations from 150 to 200 feet high the Tuarutu Range junctions with that of the Ossotschuni, about 11 miles in length running from N.E. to S.W. The steep masses of granite that were mentioned as having already astonished us so much on the Tuarutu (Sect. 128, etc.) appeared on the Ossotschuni Range in still mightier proportions Uruwai, Wapuna or Wahuma and Curischiwini are granite collossi rising from 1,500 to 1,800 feet which, by virtue of the illumination due to the sun's rays being reflected from the huge quartz-veins bounding through them, form a really magic contrast with the dark gloomy granite crags and at the same time lend the forests at their bases a more than supernatural charm. According to what the Wapisianas said, tobacco must be growing wild on Mount Uruwai. Southward from the Ossotschuni dense virgin forest extended to the distant horizon, while the ranges of the Essequebo limited them in the distant azure towards the S.S.E.

151. From the information that could be gathered here concerning the sources of the Takutu, we would be reaching a Macusi settlement within a couple of days in the neighbourhood of which they ought to be found. By the 2nd May we were so far victualled as to allow of our resuming the journey, having also received a promise to find on our return sufficient provisions to take us to Pirara. Hamlet burst into tears when we took leave and the expedition, headed by an Indian from Tuarutu as guide, made a move in the direction of the Ossotschuni Range. After crossing many a craggy hill on which grew numbers of Orchids like *Cyrtopodium*, *Monachanthus* and *Oncidium*, we reached the river Turerucata-kurin, where the abundance of water however by no means corresponded with the length of name. It pours itself into the Ossotschuni which takes its rise in the similarly-named range that we left lying on our right, to follow its slope a distance of about two miles: in this connection a high pyramidal mass of granite served as finger-post to our guides. Exhausted and panting for a drink, Taramtibawau, a small stream that bickered wildly over huge granite slabs, and sallied in and out between them, offered us copious refreshment in the afternoon. After a short rest we started again and soon climbed some heights called by the Wapisianas Wawacunaba, from the summit of which we enjoyed a most lovely view over the savannahs and towards S.E. onto Mount Vindaua, whilst towering behind them we recognised the huge bodies of the Wanguwai and Amneu Ranges in the neighbourhood of the confluence of the Yuawauri or Cassikityu with the upper Essequebo. Further towards the East there rose a mass of mountains equally as high as the Wanguwai which the Indians called Uassari, and in which my brother

identified the identical range that Alexander von Humboldt mentions in the sixth volume of his Travels. What with the trigonometrical measurements carried out, Alexander von Humboldt's determination differed from that of my brother by 40 miles too much to the North: the latter fixed its situation in 1° 40′ Lat N.

152. The Wawacunaba crags showed themselves unusually crystalline, while huge light-brown boulders and slabs of mica lay scattered around upon the savannah. I have already reported that the Indians take the mica for gold or silver (*Brata.*)

153. It was soon afterwards that we came upon a forest which in fact surpassed everything that I had previously seen: tropical plant-life seemed to have shed over it the whole fulness of her glory to an extent which even the most skilful pen might only approximately succeed in describing. Palms, *Zingiberaceae, Cannaceae, Musaceae,* and ferns constituted the rank mass of forest. Thick clusters of *Astrocaryum, Desmoncus, Bactris, Euterpe, Maximiliana* and *Acrocomia* often alternated with large stretches of wild-plantain (*Ravenala guianensis* and *Phenacospermum guianense* Endl.) that mostly reached a height of 40 to 50 feet, until collecting together again, the former were to be seen scattered about and towering over the others with their proud fronds. The noisy rattle caused by the seed falling on the huge leaves of the *Ravenala* showed how busily the innumerable parrots were engaged in satisfying their hunger with the ripe palm fruits: it nevertheless sounded as if a hail-storm had burst over the spot. The ground, consisting of a stiff clay mixed with sand, was wrapped in a thick covering of *Arum, Canna,* and fern such as *Trichomanes, Lygodium, Aneimia, Mertensia, Adiantum* and *Davallia.* A loud cry of "Snake, snake," and a shot immediately following, warned us that it was doubly necessary to be on our guard. On reaching the spot, the stricken reptile was still writhing in its blood, and the first glance at its huge fangs showed that it had to be regarded as one of the most poisonous: it measured five feet and had a blackish colour. The Indians exhibited the greatest fear and a strange terror of their enemy even when dead. Although I had never before seen a specimen, I was unable to preserve it, on account of my not having any spirits.

154. At a small creek that was slowly meandering its way through the fairy forest we pitched our camp under a huge *Carolinea* which gave rise to plenty of noise the whole night through by dropping the contents of its burst seed-capsules over our tent cover. The opposite bank consisted of so dense a barricade of bambu (*Guadua latifolia*), that it would have opposed an impenetrable obstacle to the escape of even the larger mammals.

155. Next morning we continued our journey along the Ossotschuni Ranges, where we followed a beaten track which after a two hours march led to an abandoned settlement: its three large bee-hive shaped houses were situate on a rise. The loosened soil in the centre of the largest building explained the reason that had led the residents to leave their blessed hearth and home—it was the grave of their chief, as the Wapisianas told us.

156. The still structurally complete condition of the houses showed that the occupants had left them but a short time before, and yet the provision-field was so weed-grown that *Mimosa, Solanum* and *Cordia* had already stifled the *Manihot*: only a few *Musa paradisiaca* and *sapientum* with broad torn leaves to disappear shortly in their turn, still overtopped the rank growth. A palm growing thickly in clusters on the edge of a small oasis, attracted my attention: it was my first specimen of the beautiful and delicate *Mauritia aculeata* Humb. Bonp. Notwithstanding that my brother on his previous journeys had met with it frequently on the banks of the Rio Negro, it was also the first that he had seen in British Guiana. Although the *M. aculeata* neither in height nor girth approaches the *M. flexuosa*, it nevertheless possesses the graceful growth peculiar to this genus, which makes it one of the grandest ornaments of the tropical landscape. The Wapisianas called it Urukusch. The oasis that now opened its way to us was formed almost exclusively of *Bactris, Astrocaryum* and *Maximiliana,* interspersed with an occasional big foliage-tree, amongst which I recognised to my great joy the giant Juvia or Brazil-nut (*Bertholletia excelsa* Humb. Bonp.). The huge trunk, straight as a thread, rose on an average 80 or 90 feet before it gave off its first branches, from out of the midst of which it continued to rise another 50 to 60 feet. An immense quantity of opened seed-capsules from 16 to 18 inches in circumference, robbed of their contents, were scattered around. Each of these cases contains from 16 to 18 triangular seeds known commercially as Brazil or Para-nut, but they generally lose a great deal of their lovely taste on the journey. At the time of maturity when the lids of the capsules burst and the ripe seeds fall the site of these imposing trees is not alone the place of meeting for Indians, but is also the playground for a number of rodents, bush-hogs and monkeys. The nut is a tit-bit just as much in request by the latter as by the former. This is especially the case with the monkeys who will invest such a tree in whole troops: stories are even told to the effect that when, on account of the size, they cannot bite open the rocky hard case that often drops unopened, they will hammer it with stones in order to extract the nuts desired. The cunning creatures have certainly not yet brought their deductions to such a pitch of perfection, but they do indeed leave the opening of those seed-capsules that are beyond the powers of their own dental system, to the care of other animals, particularly the Aguti (*Dasyprocta Aguti*) and Laba (*Coelogenys Paca*), as well as to the bush-hogs (*Dicotyles labiatus* and *D. torquatus*) from under whose very trotters, as soon as a hole is made, they steal the hard-earned prize, to rush with it up the nearest tree and there devour the proceeds in peace. If the trick does not succeed with the capsule as a whole, it certainly comes off with scattered nuts. From enquiries made, the *Bertholletia* seems to prefer a stony soil, and to be seldom present higher than 1,500 nor lower than 400 feet above the sea level: its geographical distribution must be fairly extensive, for according to our present and my brother's previous experiences, it stretches along the plains between 57° and 68° Long. W. and between 6° Lat. S. and 4° Lat. N.

157. Next to the palms and *Bertholletia*, this same forest still further interested me on account of a huge colony of Cuschi ants that crossed our path in a one-foot broad continuous column on its way to a mound several hundred feet in circumference and six feet high. A poor *Bertholletia* had been chosen as the field for destruction. Thousands were busily occupied in bringing the little round chips bitten off the leaves down to the foot of the tree, where they were taken from them by others, that now carried them to the nest.

158. On the other side of the forest we once more came upon open savannah, climbed over isolated dome-like hills, strewn with quartz fragments and huge slabs of mica and, after clambering down the slope of a timbered height upon which a 120-ft. high *Ficus* attracted our attention, finally reached the Macusi village of Maripa, consisting of two houses situate in the adjacent plain. Although a pack of really furious dogs, which was continually being increased by newcomers, tried to contest our right to approach, and all the tame poultry, with a cacophonous cackling, were scattering in the wildest confusion, the blows aimed by the women finally made a passage for us possible. During this scene the chief of the settlement, Tuma-Tuma, the stoutest Indian I had ever seen, was lying quietly in his hammock in a small open house, and regarding our arrival with the greatest indifference imaginable: he calmly continued puffing his cigar, even after we were all collected round his dwelling, and amused himself with the blue smoke-clouds that he was blowing into the air in curls. To rouse him out of this apathy, Sororeng went and notified him of the object of our journey and of our presence: the usual "Ahem" was the only effect produced by this bit of news, and the barely interrupted smoke-rings gaily whirled from out of his mouth once more. We had never yet been treated by any chief with such persistent disrespect and indifference, although we were the first Paranaghieris to have visited the settlement.

159. While still annoyed over the fat chief's stoic equanimity, our attention was drawn to a sickly-looking, thinner and younger man who had just emerged from one of the houses in an extremely ridiculous costume. A scarlet red night-cap was drawn over the pale lean face as far down as the eyes, while a spotted shirt concealed the upper part of the body, and a pair of linen trousers that had once been white, and only reached down to the calves, covered the lower extremities so far as its shortness permitted. After staring at us for a moment he came and greeted us in the manner peculiar to the Macusis. He was a relative of the corpulent chief and one of the most celebrated dog-trainers from whom the Indians far and near bought their hunting-dogs: it was by this means that he had come into possession of the costume described. The number of villagers amounted to twenty; that of the dogs to at least double.

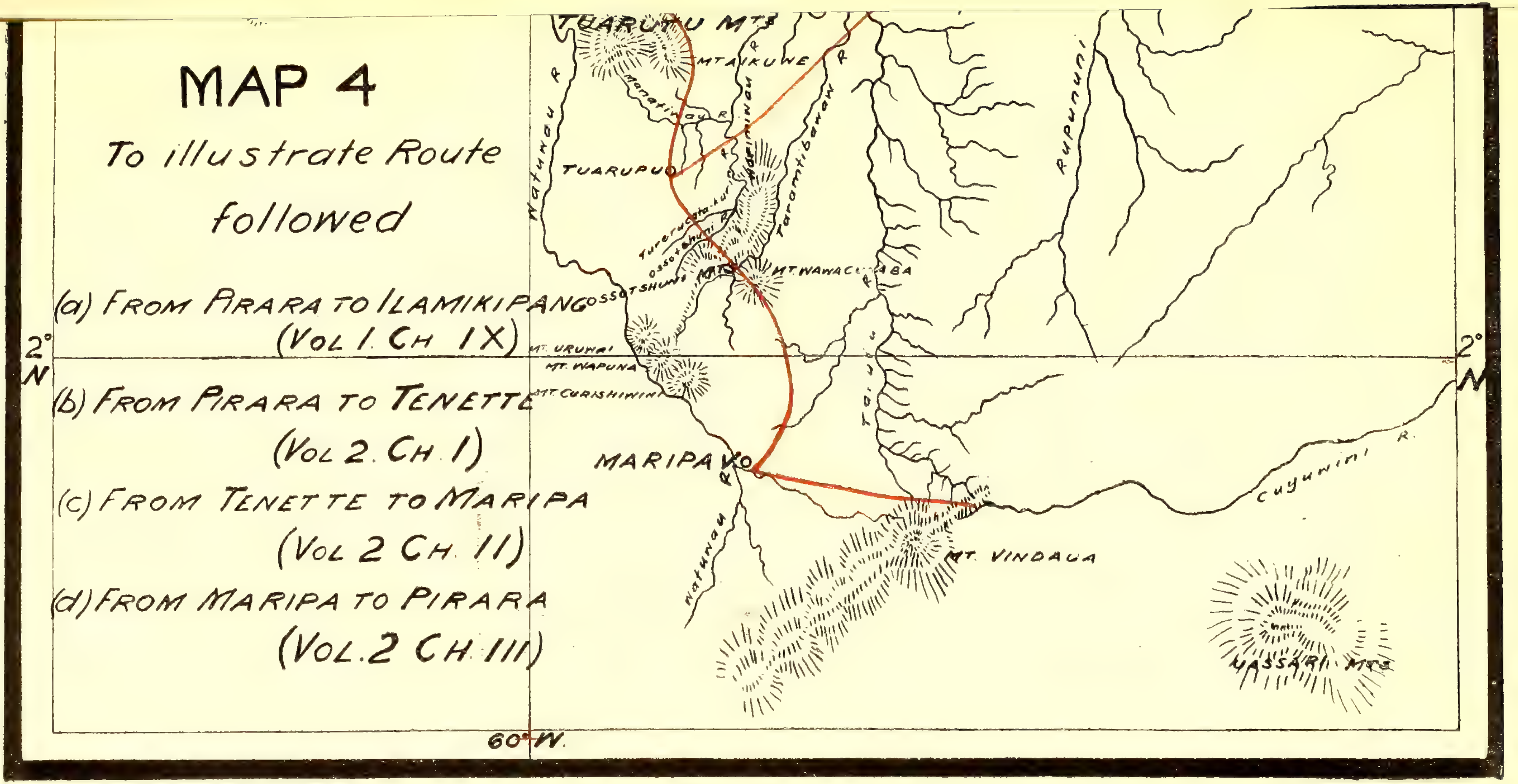
160. As the chief's indifference did not in any way seem to melt, the most sensible thing we thought we could do was to treat him in similar fashion: there was no difficulty in this because both the sickly fellow and the whole of the female population received us most friendly. Without taking any further notice of Tuma-Tuma we pitched our camp

on the lowland bordering on the two houses, where the Watuwau, that we had crossed as a raging current, now wended its course as an insignificant stream, some few yards wide. The source of the Watuwau is to be found 6 miles further south. We had hardly completed fixing up our quarters before the inhabitants of the next settlement came up with their chief in the lead, to see the Paranaghieri of whose advent they had already been advised in the morning by a Wapisiana from Tuarutu who had not begrudged himself a two-days' march to give his friends the important news. The two dignitaries, our stoical Tuma-Tuma and the ruler just arrived, formed the greatest contrast possible in body and temperament, for which reason we heartily welcomed the latter, terrible as his withered dried-up naked one-eyed figure appeared, and paid him every imaginable attention. He kindly offered to bring us as much cassava bread as we wanted by the early morning, and also to accompany us to the sources of the Takutu which he had visited only a short while before. So far as could be judged from outward appearances the courtesy which we showed the good-natured one-eyed chap did not in the slightest degree arouse the envy of the comfortable well-nourished sluggard: as he received us, so he treated us during the whole day, coldly and contemptuously. But when next morning the neighbouring Indians, who had arrived laden with food-provisions for which they had been richly rewarded, hurried up to the village, with the greatest glee and truly childish triumph, to show their presents and things, Tuma-Tuma's coldness and apathy came to an end—for to our great surprise we suddenly saw him coming down the rise with several of his Indians and women towards our camp and enter our tent, where he regarded every object that met his gaze, with the most strained attention. A compass seemed especially to prove a puzzler, and excited his whole curiosity. When he finally satisfied himself that every effort to give the needle another direction was fruitless, he put it back in its place with a shake of the head, looked upon us wonderingly, and from now on proved to be the most agreeable good-tempered fellow that one could possibly wish for. His abominable behaviour seemed to have been less due to his own natural character than to the hitherto continually cherished distrust of our real intentions.

161. Previous attacks of fever as well as a fresh and a severer one had so exhausted me that on the following morning I was prevented accompanying the party to the sources of the Takutu; a similar lot befell Hendrick, whose twisted foot was so swollen that he could not leave his hammock at all and was accordingly obliged to keep me company.

162. On the 5th May, the remainder took their departure in company with the one-eyed chieftain, and it was left to us to while away the time until they returned as best we could. This I found fairly easy with the curious and wild capers of a young tiger-cat which one of the Indians had caught some few days before, and had tied up with a string in one of the houses. Unfortunately the creature was still too young to allow of my distinguishing whether it was *Felis pardalis* or Prince von Neuwied's *Felis macroura*.

163. From the number of jaguar and tiger-cat skins, but especially from the number of teeth which the women as well as children wear



TUARUTU MTS
MT AIKUWE
Manatinau R
Natunau R
TUARUPU
R
Taramtibauaw R
Tureruqata-kuri
Ossotshuni R
OSSOTSHUNI MTS
MT. NAWACUWABA
R
Rupununi
MT. URUWAI
MT. WAPUNA
MT. CURISHININI
Taiuc R
MARIPA
R
Natunau
MT. VINDAUA
Cuyunini R.
MASSARI MTS
2° N
2° N
60° W.

MAP 4

To illustrate Route followed

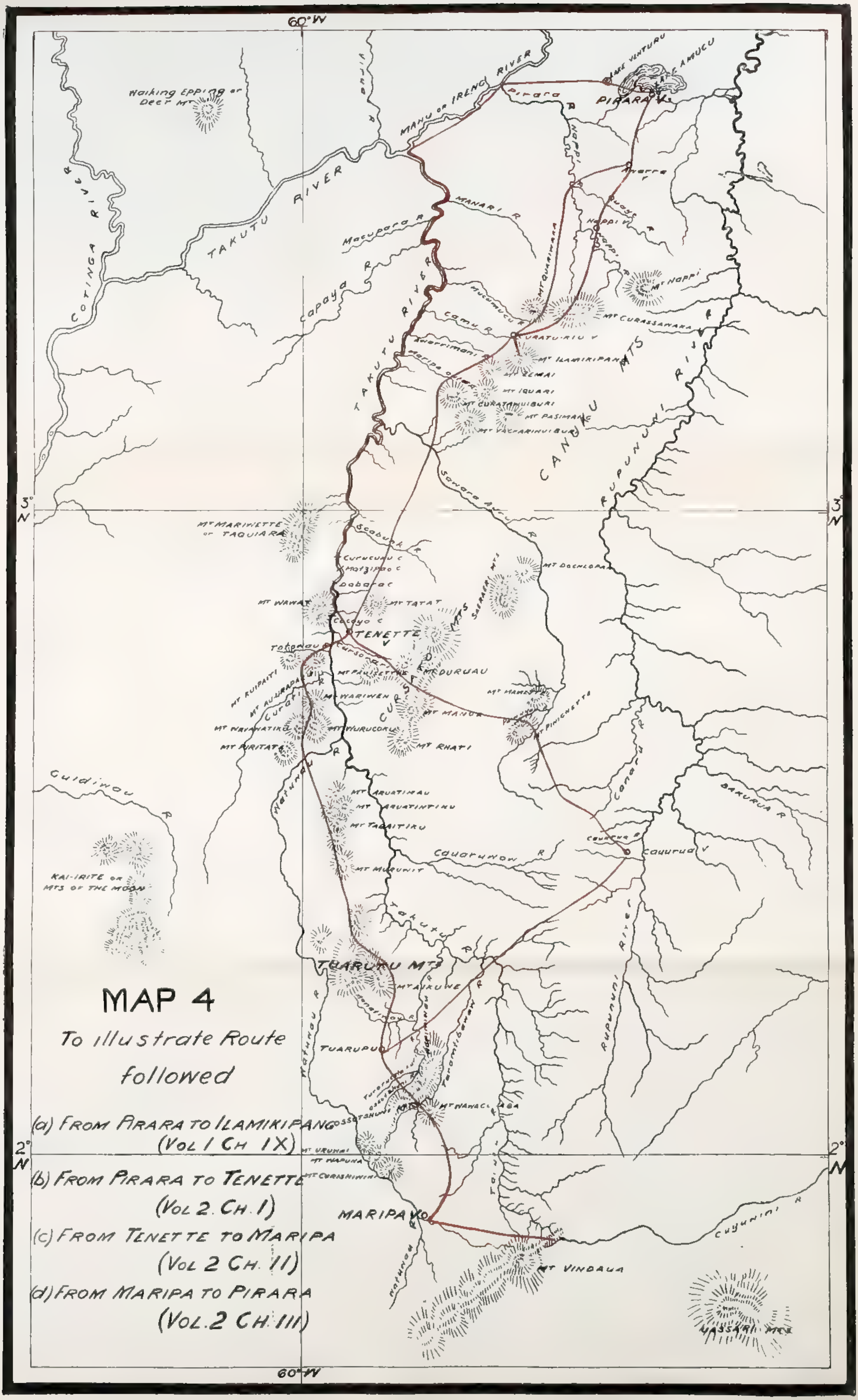
(a) FROM PIRARA TO ILAMIKIPANG
(VOL 1. CH IX)

(b) FROM PIRARA TO TENETTE
(VOL 2. CH. I)

(c) FROM TENETTE TO MARIPA
(VOL 2 CH. II)

(d) FROM MARIPA TO PIRARA
(VOL. 2 CH. III)

V. ROTH, del.



MAP 4

To illustrate Route followed

(a) FROM PIRARA TO ILAMIKIPANG
(VOL I CH IX)

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(c) FROM TENETTE TO MARIPA
(VOL 2 CH. II)

(d) FROM MARIPA TO PIRARA
(VOL. 2 CH. III)

60° W
3° N
2° N
Haiking Epping or Deer Mt
COTINGA RIVER
TAKUTU RIVER
MAHU OR IRENG RIVER
Pirara
PIRARA V.
LAKE VINTURU
L. AMUCU
Nappi R
Awarra
Nappi V.
Quaye R
Mt Nappi
MANARI R
Macupara R
Capaya R
Mucumucu R
Camu R
Mt Quariwaka
Mt Curassanara
URATU-RIU V
Awarrimani R
Mt Ilamikipang
Mt Zemai
Mt Iquari
Mt Curatamuiburi
Mt Pasimang
Mt Vacparinuiburi
CANUKU MTS
RUPUNUNI R
Sawara Auru R
Mt Mariwette or TAQUIARA
Scabunk R
Curucuru C
Matzipao C
Dobara C
Mt Wawat
Mt Tatat
Cacayo C
TENETTE V
Tokpnau
Cursonari
Mt Dochlopa
SARARA MTS
Mt Kuipaiti
Mt Auurada
Curati R
Mt Paukethe
Medouruau
Mt Wariwen
Mt Navahatiku
Mt Wurucoru
Mt Manoa
Mt Piritata
Mt Rhati
Mt Manette
Mt Pinichette
CURSATI MTS
Guidiwau R
Watunau R
Mt Aruatimau
Mt Aruatintiku
Mt Tagaitiku
Mt Murunit
Canaru R
Bakurua R
Cauarunow R
Cauarua V
KAI-IRITE OR MTS OF THE MOON
Takutu R
Rupununi River
TUARUTU MTS
Mt Aikuwe
Tuarupu
Tarumitaban R
Mt Nawacl aba
Ossotshune
Mt Uruhai
Mt Napuna
Mt Curishinini
MARIPA V.
Watunau
Mt Vindaua
Cuyuwini R
MASSARI MTS

V. ROTH, del.

round their necks as talismans, these animals must be fairly plentiful in the neighbourhood of Maripa. Only a few days before, close to the village, a jaguar had been killed: the canines testified to its huge size, for they were 3½ inches long and had a circumference of 3 inches at the root. The Indians told us the strangest stories about the daring and rapacity of the jaguars of the Tuarutu and Vindaua Ranges, according to which they even attack men up there; this did not appear to me to be specially far-fetched because both ranges hardly shelter any deer, and the bordering savannahs graze no wild cattle-herds, which are only met again 100 miles further to the north, so that the blood-thirsty animals are limited to but smaller quadrupeds such as agutis, labas, and pekaris.

164. I have already mentioned that the Indians make their hunting-bags almost always out of jaguar and tiger-cat skins. Although on certain occasions I saw hundreds of Indians assembled it only very rarely happened that amongst their hunting-bags or on the skins forthcoming in their settlements, I found two or three entirely corresponding with one another in pattern: the ground-colour of the pelt of some was more russet, of others more pale (greyish), and others again more brownish: the size of the rings also varied, according as some were more or less complete, nearer or farther apart, here lighter or darker, there distinctly or lightly dotted in the centre: indeed, the variation of pattern proceeds to such an extent that only rarely does one side of an animal correspond in exact pattern with the other. I accordingly consider it not uninteresting to record here the notes and observations made by my brother and myself during the course of our travels in connection with the cat tribe, without thereby entering into too detailed a description. Azara has given an excellent account of the life-history of the cats in general. Guiana possesses only two really main types, represented on the one hand by the jaguar (*Felis onca*) and on the other by the puma (*Felis concolor*), of which the former at all events is the stronger, the more bloodthirsty, and at the same time the larger. In the course of my brother's former trip there was found in the savannah on the bank of the Padauiri, a tributary of the Rio Negro, a jaguar skeleton which, inclusive of the tail, measured 9 feet long. Although in British Guiana alone, there are present eight spotted and five spotless cats which are not only dubbed with special names by the Indians but differ essentially in the colouring of the skin, their many differences in the markings might be regarded rather as varieties than as true indications of species. Unfortunately we were unable to investigate by means of a complete specimen each single one of the 13 differentiated by the Indians: of the larger number we managed to see only the skins and even these were in a mutilated condition.

165. As I have already stated the jaguar (*Felis onca* Linn.), the tiger of the Colonists, Taikusi of the Macusi is the most rapacious and consequently the most dangerous enemy of the cattle-herds, sheep-flocks and piggeries. We found it with but slight change of colour from the coast to the equator.

166. An essentially different variety of it or species (?) is the turtle-tiger of the Colonists. Its marking is almost always black, the

ground-colour of the pelt more dark-yellow-brownish, its build indeed powerful, but yet somewhat smaller than the *Felis onca.* Although it causes serious damage among the herds on the farms, its favourite food nevertheless seems to be turtle: this it waylays on the sandbanks, places its claw on top, and now very skilfully bites out a round hole along the line of junction between the back and front shields, through which it then pulls out the flesh with its fore-paws. The Waracaba-Arowa* of the Arawaks (Waracaba is the name given to the Trumpet-bird, *Psophia crepitans,* and Arowa means a tiger) must, according to what they say, be very wild and bloodthirsty and only met in the thicket forests: it has received its name from the peculiar colouring of its breast which is said to exactly resemble that of the feathers of the *Psophia.* The Abouya-Arowa or Pekari-tiger of the Arawaks is for its size an unusually powerful creature. Its length does not exceed 4 feet, of which 16 to 18 in. include the tail. The ground-colour is a dark yellow-brown, along which from the back to the tail there run long black stripes that enclose a somewhat darker patch than the ground-colour. The sides of the animal as well as the remaining portions are covered with irregular spots. The tail is considerably shorter than that of the others. It is very frequently present on the coast where it commits plenty of damage, particularly on the sheep and pigs. It is probably *Felis pardalis* Linn. The Laba-arowa is the size of a wild cat: the ground-colour of the skin is light brown, and the spotting much larger than in all the others. These spend the greater portion of the night visiting the fowl-roosts of the estates' owners, more often on the coast than in the interior. As I have already stated, Laba is what the Indians call the *Coelogenys paca* which this creature is said chiefly to hunt. The cat that the Indians call Aguti-arowa is probably only a variety of it: its pelt has the same ground-colour: its marking only varies from that of the Laba-arowa in that it is not only smaller, but is particularly also closer. It has received its name from the Aguti, which, like the former whiskered animal, it is especially fond of devouring. It is probably *Felis macroura* Neuwied.

167. The Indians give the name of rat-tiger to two considerably smaller species. Their ground-colour corresponds entirely with that of our young deer whilst that of the head and neighbourhood of the shoulders is dotted alternately round and oblong. The tail is white and ringed with black. They hardly attain the size of our tame cats, and their prey seems to consist entirely of birds. Both are present only in the thickest forest. They stand close to *Felis tigrina* Linn. With the *Felis concolor* (Puma) the Indians distinguish the Wawula-Arowa from the Soasoranna-Arowa: the former is met with as much in the forests of the coast as on the savannah, the latter only on the savannahs of the interior. The Wawula-arowa (*Felis concolor*) is already so well known that it requires no further description. So far as strength is concerned it is in no sense inferior to the jaguar, and a trustworthy plantation owner assured us that he had shot one which was at the very time engaged in dragging a mule, that it had suddenly fallen upon, across a plantation-trench about half-filled with water, and up the

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* This Waracaba Tiger is a myth. See Roth's Animism and Folklore, etc., p. 367 (Ed.)

hill bordering on it. Like the jaguar, the puma appears to have a special fondness for dogs which it waylays in every kind of manner, but should it however be pursued by them, it immediately seeks safety up a tree, where it can usually be shot without any danger. Equally greedy of prey it follows the troops of Pekari and with sure spring suddenly attacks the stragglers, but takes good care not to direct its attentions on the middle of the troop, because it would have to pay for such a criminal undertaking with its life. The female throws two young every time: dark spots can already be distinguished on them.

168. The Wilibisiri-Arowa is also an unspotted cat which nevertheless is described as very rare. Its colour is given as light grey, approaching to white on the body and breast, just as the tail is said not to have the black tip of the puma. The Indians, as already mentioned, call the smallest species of deer present in Guiana, the Wilibisiri, and it is this one that the tiger in question particularly hunts for. It is probably *Felis unicolor*?

169. The Hacca-Arowa of the Indians (*Felis Yaguarundi*) which I often came across is somewhat larger than our house-cat: its colour is a dark grey-black which on the belly passes into a mouse-coloured grey. The tail has also no rings. It receives its name from the glutton (*Gulo barbarus*), the hacca of the Arawaks which it resembles in its colouring.

170. Still more feared than the ordinary jaguar and puma is the black jaguar, the black tiger of the Colonists. Whether it is only a variety of the ordinary *Felis onca* I must leave to the decision of zoologists: according to my conviction, however, it is to be regarded as more than such, as a distinct species, since it is distinguished not only by its absolutely different colouring, but particularly also by size both from the puma as well as from the jaguar. The brilliant black velvet-like shade and the still blacker complete pattern which one can only see, however, when the light falls at a particular angle on the pelt, makes it one of the most beautiful skins that can be found. The animal must be exceedingly rare because during the whole of my stay among the Indians, I only found two skins but never saw the cat itself. The one pelt was on the Morocco, where the animal had been killed by an Indian in the neighbourhood of the mission,* the second at Fort Sao Joaquim; but on both occasions they were so mutilated by the cutting off of the feet, that they were of no use for definite determination. Judging from the intervening distance at which the animal in both cases had been killed, it must be distributed from the coast to the equator. On the Demerara it is said to be not rare: there the Indians call it Maipuri-Arowa because it is specially fond of waylaying the tapir. Its tail is considerably longer than that of the ordinary jaguar: in its formation of skull it seems rather to approximate the puma. The Indians are not as much afraid of all the others put together as they are of the black one alone, because it will attack human beings by day or night just as blood-thirstily as it will the Tapir and cattle. According to all accounts the *Felis onca* and *F. con-*

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* About eight years ago I saw two black tiger-cubs at Warramuri Mission, Moruca River. They were but a week or two old, and had been found within the roots of a Mora tree that the Indians had been felling: they only survived a few days. (Ed.)

color are more common on the coast than in the interior, and hardly a year passes in which 20 or 30 are not caught in large traps and killed. The amount of cattle-breeding that is carried on, particularly by the estates and farms between the Essequebo and Berbice, seems to have been especially instrumental in bringing the animals here. When once they have fixed their lair in the neighbourhood of such a homestead, seldom a night passes but they go and rob the herds. They usually suck the blood out of the dead beast and eat some 10 to 15 lbs. from the breast or neck, either leaving the remainder where it is or dragging it into the neighbouring brush-wood: only the most dire necessity will bring them back to what is left. In spite of the many fires which the cattle-owners may light during the night around the fences, these do not by any means succeed in keeping them away.

171. The construction of the traps mentioned above entirely corresponds with those used by us for catching rats or martens. It consists of a large box the thick boarded covering and similar flooring of which is clamped on all four sides with strong iron bars, and has at the one end a drop-door which is held up by means of a trigger-board. Within (and at the other end of) the box is a compartment divided off from the main chamber by strong iron bars, in which a sheep or goat is enclosed, and the trap then set in a somewhat out-of-the-way part of the estate. When the jaguar or puma creeps through the drop-door into the box to secure the bait and treads on the trigger-board, the door drops behind it and the thief is caught. By this means our friend, van Günthern, on Plantation Greenwich Park, had in the one year outwitted four animals, one of which nevertheless managed to break down the thumb-thick iron bars, during the course of the night and so get away. The fury of the ensnared beast, its roaring, and its frantic fight for freedom, are said to have something truly horrible about them: it is usually shot in the trap. Shortly before my departure for Europe a bold young *Vaqueiro* (cow boy) 18 years of age on one of the farms in the neighbourhood of the Demerara had on horseback lassoed and strangled a jaguar that had approached the herd in the daytime. The brave deed was the daily topic of conversation for weeks, and as this was the second animal he had killed within a short period, he received a handsome reward from the Governor.

172. I have already mentioned that the jaguar often fetches the dogs from out of the centre of a circle of Indians or out of the homesteads, and also the surprising fact that as soon as it is pursued and hunted by a pack of them, it makes its escape up the first convenient obliquely-slanting tree where it mostly becomes an easy prey for the huntsman. But if the shot misses or if the jaguar is but slightly wounded, it certainly turns with overwhelming fury upon its pursuer, who now can only save himself by some other means or by cold-blooded presence of mind. On my trip up the Demerara I met a Negro who on such an occasion had lost not only his right hand, but a considerable portion of his shoulder-muscles. He had gone hunting in company with an Indian and his three dogs. The dogs drove a jaguar out of its lair, which finally took refuge on a half-uprooted tree. Barking loudly, the dogs surrounded it, the Negro approached to within about 18 paces, fired his

weapon, and wounded the furious beast, but not mortally, when with a couple of springs the maimed creature caught up to the unfortunate huntsman, stuck its paws into his shoulders, and next minute would have torn his neck to pieces. To ward off the awful moment, the unfortunate sportsman must just then have unconsciously driven his right hand down into the blood-thirsty animal's jaws, because when he again recovered his senses, there lay the cat in its death-rattle, with his hand close by. At the psychological moment, the accompanying Indian had reached the scene of strife and stuck his long cutlass into the beast's heart, without however being able to prevent it in its death-struggle biting out from the already unconscious Negro the whole of the shoulder flesh into which it had fastened its claws. We were furnished with several accounts of the jaguar attacking people of its own accord. Thus, one of my brother's carriers on his previous journey still bore on his breast the scars caused by one of these animals' teeth: the Indian while yet a boy was proceeding to the cassava-field with his grandmother when the jaguar, rushing out of the thicket seized him by the breast and was dragging him off when it was stopped by the spirited old grandmother who, attacking it with her cutlass, gave it such a surprise that it let the boy drop, and took to flight.*

173. Except during the period when the female has her young, the jaguar does not seem to possess any particular lair, but rambles about everywhere. On seeing people, when unaccompanied by dogs, it never takes to flight, but proceeds at a quiet pace, during which it now and again turns round. It is only when its pursuers are too close upon its heels, and their number appears likely to overcome its powers, that it takes on a short trot. It swims over the widest rivers with the greatest ease with its tail exposed and bent above the surface, so that it can be recognised already from a fair distance off: when it now climbs the bank, before making a start overland, it shakes the water off its back just like our dogs do. When circling round a camp or cattle-pen, it is always with a continual purring: not until hunting at night for its prey, does it set up a frightful roar, that booms through the whole forest. Not only Indians, but also the most trustworthy Colonists have assured us that they have been witnesses of fights between kaimans and jaguars, combats that one had hitherto always regarded as myths. From what we were told, the jaguar only succumbs in such a battle, which commences always on land, when its claws get wedged into the belly-plates of its opponent, whereupon the latter usually drags it into the near water and drowns it.

174. It was on his previous expeditions that my brother first became acquainted by personal experience with the almost inconceivable boldness of the jaguar. While staying at Curassawaka, a Carib village on the Rupununi, the suspicious purring just mentioned and the awful roar during the course of the night indicated the presence of one of these animals. My brother's tent was pitched about 100 paces from the houses of the Indians. One of his sluts had a pup that was missing

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* Cases are on record where a jaguar has run off with infant children. (Ed.)

in the morning, and soon after a hammock that had been washed and placed in the tent disappeared, and so on each following night another piece, a cloth or a cooking utensil was gone. Suspicion naturally fell on the Indians, in spite of their assurance that the jaguar was the thief. All attempts at scaring away the author of the mighty row proved in vain. The robberies soon extended to the tents of his three European companions, and suspicion was still further aroused against the villagers. The ferocious howl of the animal had naturally made the company cautious and my brother, while working in his tent late at night after a recent robbery, had kept two loaded pistols at his side. He just happened to look up from what he was doing, when he saw in front of him something that he could not quite make out, owing to the hammock having been already slung: he accordingly held up the light only to recognise the jaguar standing four paces ahead calmly gazing into his eyes, but before he had time to seize the pistol his troublesome visitor had disappeared. Next night he was awakened from sleep by an animal that was just about creeping under his hammock and brushing its back up against his: thinking it was one of his dogs, he gave it a sound slap—he did not hit the dog, but the jaguar which, with a growl, made a spring through the tent-wall. In the morning a general hunt was organised in the course of which, not the disturber of the peace, but certainly the stolen goods, down to a table-cloth, were found scattered through the brushwood. What prompted the animal to these extraordinary robberies it would be hard to say, because up to the present the magpie's lust for theft has never yet been observed in this genus. Our second cook, Adams, played a part in a similar visit during the journey to the sources of the Corentyne. In that case a loud cry of distress woke the whole camp out of their slumbers when the distractedly yelling cook told them that, unable to fall asleep he was lying awake in his hammock, when suddenly a large dark object which he soon recognised to be an animal, approached his bed and sniffed him from top to toe. Stiff with horror he lay in his hammock as if dead until a pair of glowing eyes approached his face: with that the spell was broken, and shrieking for help he had jumped out of his hammock. The jaguar had disappeared, but the tracks left behind betrayed its presence.

175. As the Museum possessed a collection of Guiana quadrupeds and economy was essential, I received instructions on my departure from Berlin not to prepare and despatch any of the larger representatives: I now regret having obeyed the order and not having forwarded the varieties mentioned, because on my return I looked around for some of them in vain.

176. The number of baskets with Brazil nuts that I found in the houses at Maripa shewed how plentiful the *Bertholletia excelsa* must be in the Vindaua Ranges.

177. The fever permitting of my making a short excursion to the neighbouring village, I wended my way there in company with some Indians through forest and over savannah where the *Mauritia flexuosa* reached a height of 100 ft. and the *Mauritia aculeata* certainly one of 50 ft. The small thick clusters and fan-like fronds of the latter, owing

to several yellow and bluish concentric stripes at their centres, presented an unusually lovely colouring. The forest consisted for the most part of huge species of *Ficus,* the fruits of which had just then reached maturity. Fern, *Rapatea, Alpinia, Calathea* and *Canna* spread over the ground. A number of brilliantly ornamental birds *Ampelis pompadora,* called by the Indians Wallababa from the sound of their husky note, were perched upon the *Ficus* trees so that within a few minutes we had already secured five specimens. However abundantly the *Ampelis Cotinga* Linn., *A. coerulea* Tem., *A. Cayana* Linn., and *A. pompadora* Linn., are met with in Guiana, particularly on the Demerara, especially in November up to the middle of January, when the fruits and seeds of the different species of *Ficus, Brosimum* and *Psidium* reach maturity, they nevertheless suddenly disappear out of the forests from March until the end of October, when they are once more to be seen at the commencement of November: the anomaly of their presence here (in March) was therefore all the more extraordinary to me. That the above species of *Ampelis* are only met with in British Guiana as migrants seems to follow among other things from the fact that one finds on their first appearance every transition in plumage and age but never quite young birds: the latter cannot probably as yet undertake the journey owing to the weakness of their flight-muscles, or else during their first year of life subsist on food not to be got here. During the whole of my four years' stay birds of such tender age were just as rarely seen by me as were their nests known to the Indians and backwoodsmen, and yet these latter are the most excellent empirical naturalists that are to be found anywhere: indeed, I must explain that I never considered any of my observations and experiences concerning animal life valid, and never recorded them here unless they corresponded with those of these people. The accounts of the Indians are far from being as absolutely trustworthy as the statements of the grey-haired backwoodsmen, but according to the assurances of both, who were in agreement, the species of *Ampelis* cited must betake themselves to Cayenne and spend the breeding season there. It was surprising to me that, with regard to their breeding, I could learn just as little concerning the genera *Chasmarhynchus, Procnias* and the species *Ampelis carnifex* although the latter remains here the whole year round.

178. At the settlement of the one-eyed chief who, with the largest portion of the male inhabitants, had gone ahead with my brother, the women left behind had the greatest difficulty in protecting me from the ferocious dogs. When finally their blows had quietened some and driven off others of the raging pack, I was able to enter the old man's large roomy and cleanly house the walls of which were built of tree-bark instead of clay. Both hunting and household implements were hung up and put away with a love of order and care that I had never yet observed among the Indians. The whole female population was engaged in spinning cotton, but I exerted myself in vain when I tried to seduce them into selling the prettily carved weapons of their absent husbands.

179. After a short visit we turned to another village the two new bee-hive houses of which had already smilingly invited us in the dis-

tance from above the low-lying *Curatella* and *Bowdichia* trees, while the laughter and joking in the larger of them showed that we had arrived under felicitous auspices. The male occupants, squatting and quite happy, encircled several large earthen vessels filled with paiwari and were handing round perhaps for the hundredth but certainly many a time, in conjunction with the calabashes, all the articles of trade that they had received in exchange for their provisions the day before. The women were busy stringing their glass beads. My Indians had naturally immediately taken up their places in the circle, and plied the cups as diligently as possible, while all I did was to examine the household implements. After an hour's rest, during which they threatened to drown me in paiwari, we made our way back to Maripa which we nevertheless reached before sundown.

180. By mid-day of the 7th May the party had already returned from the sources of the Takutu which my brother found to be in 1° 5′ Lat. N., 19 geographical miles west of Pirara. From its source onwards the Takutu flows towards N.E., receives in 1° 55′ a tributary, about the same size as the main stream, coming down from Vindaua, and then strikes a course towards N.W., to run through an extensive savannah which is here and there occupied by forest, until, on the further side of the Tuarutu Range and to the eastward it is joined by the waters of the Watuwau. From there onwards it cuts through sterile savannah flats already mentioned where its tributary streams consist only of small rivulets, until the Mahu forces its way into it in 3° 35′ Lat. N. and 24 miles westward of Pirara whence, merged now together, they make their way towards the south-west, receive the Zuruma or Cotinga on the right bank, and finally in 3° 1′ 46″ Lat. N., some hundred yards above Fort Sao Joaquim, junction with the Rio Branco. Its whole stretch, according to my brother's calculations, might amount to some 200 miles: during the last fifty it takes a regular backward course while turning towards the Rio Branco from N. to S.W.

181. The journey to its source was attended with the greatest difficulties because it led all the time through pathless forest. All the river-beds the party crossed were without water, until after a four and twenty hours' march they were able to quench their thirst in the waters of the Takutu. Its bed was still 10 to 12 feet wide here and consisted of a number of connected pools containing almost blackish water, a colour that it only first lost when it flowed through the ochreous and clayey savannahs. Owing to the tint, the Wapisianas call it Buti-vanura or Black Water. After following the banks several miles farther up, the party struck the source of the river itself in a thicket of wild bambu and trees reaching to the skies.

182. One of the Indians of the party brought back a dead Couata monkey (*Ateles paniscus*, Geoff.) that he had killed out of a troop in the neighbourhood of Maripa.. It is unquestionably one of the ugliest of apes and the huntsman having, immediately after arrival, singed it with a view to supper, I was so struck with its resemblance to a negro child, that I had to turn away from the meal so as not to re-awake antipathies

that I had scarcely managed to suppress. The Indians' statement that these monkeys when pursued, break off dried twigs and sling them at their pursuers, was confirmed by Mr. Goodall who took part in the chase. The *Ateles paniscus* is limited to certain localities only. One finds them mostly in companies of 16 to 20: often also in a lesser number. I never noticed them on the ground but always only on the highest trees. When exposed to the full rays of the sun, they lie at full length stretched out on the branches, to bathe themselves in it. This loathsome monkey uses its tail in all its movements and when pursued, escapes with considerable rapidity, but it does less springing than the others.

CHAPTER III.

Preparations for the return to Pirara—Geographical situation of Maripa—Division of the Party—Departure from Tuarutu on the old road—Indian Fire-apparatus—Dasypus giganteus—Dasypus villosus—Dicotyles labiatus and its chase—Gulo barbarus—Embarkation on the Takutu—Dicotyles torquatus—Arrival in Tenette—Mr. Fryer—Meeting with the other party—Sources of the Rupununi—Pinighette Range—Mamette Range—Harbingers of the rainy season—Departure from Tenette—Calycophyllum Stanleyanum—Use of the seeds of the Mimosa acacioides—Honey bees—Return to Pirara—Transport of Provisions from Georgetown—Return thither of Petri and the boat.

183. The object of the expedition being attained, nothing stood in the way of our immediate return had not my brother wanted to determine the geographical situation of Maripa, which was soon fixed as 1° 54′ 37″ lat. N., and 59° 45′ long. W.

184. Hendrick's foot was unfortunately not sufficiently recovered to allow of his coming along with us, for which reason we found ourselves forced to leave him behind until his cure was completed. So that he should want for nothing, and could later on hire guides for his return to Pirara, we supplied him with an adequate quantity of "trade." On the evening before our departure, the red-capped young Indian who had gone out to hunt jaguar, brought in a Kairuni (*Dicotyles labiatus*) that was infinitely more acceptable than the biggest feline, because for some days past our food had consisted of nothing but vegetables. To render the flesh palatable he had, immediately after killing the beast, cut out the peculiar dorsal gland which secretes a strong offensive smelling fluid. The meat differs both in appearance as well as in taste from that of our pigs. What was left over from supper we smoked during the night. Kair means evil-smelling among the Macusi, and hence the name Kairuni.

185. The one-eyed chief, who had become strongly attached to us, or rather to our articles of trade, as well as several of his subordinates and residents of Maripa, offered their services to us as carriers to Tenette: these we gladly accepted because we had to take with us our supplies of cassava bread from Maripa and Tuarutu, since we could expect nothing in Tenette.

186. When we left, our party numbered 50 people and a pack of 25 dogs. In no settlement had I yet found so many and such lovely dogs as in Maripa. The most beautiful of all, however, was Tewanau that was swapped by the red-capped Indian for a gun. It stood 1 ft. 11 in. high, and measured from snout to tail-tip 4 ft. 3 in., of which 1 ft. alone included the tail. It was a pity that the lovely creature was castrated, but the Tarumas like the Brazilians customarily do this with their dogs. The little tiger-cat was carried by one of the Indians in a sort of cage.

187. With plenty of noise and still more barking, the expedition finally made a move, while the fat chief, Tuma-Tuma, calmly remained in his hammock smoking a cigarette. At noon on the following day we reached Tuarutu settlement once more and no one expressed greater delight over it than Hamlet who had again given himself up as forgotten and lost. The effects of his agony of fright had still left such marked traces on his previously smug countenance that none of his former acquaintances would have recognised him in his present condition.

188. The inhabitants of Tuarutu and its surrounding country having received word, had baked such a quantity of bread that we could decide upon continuing our journey onwards already by the following day, 12th May, but this had to be done in two parties. My fever of late had been attacking me daily as badly as ever and the nearest, *i.e.*, our old, road to Tenette was the better for me in my weakened condition. My brother, on the other hand, wanted to cross the Takutu, and to return with Goodall along the eastern bank. In the afternoon I visited yet another settlement where I found the inhabitants at meal: they were devouring a Kaiman tail which, however, did not at all manage to whet my appetite. Among the people feasting was a deaf mute, a powerful man of between 25 to 30 years of age, who, while we were as yet hardly near the circle, quickly rose and somewhat clumsily tried to hide several of the weapons in a corner of the house, a procedure which was unintelligible to us until Sororeng gave the explanation asked for. By some means or another he must have got to learn that we were very keen on bartering for these articles: and rather than be tempted now to prove untrue to his beloved weapons for the sake of a knife or something of the sort that might be offered, he had considered it more advisable to put them out of sight. As an attempt at compensation for having made the deal for them impossible, he tendered a large supply of tobacco (Cawai) for barter. The preparation of tobacco is quite a simple matter for the Indians, for they just collect the larger leaves, hang them up separately for a few days in the shade of the house, and when they commence to become yellow, lay them lengthways together in bundles as thick as one's fist which they then tie up tight with bast-fibre.

189. On the following morning I left with Hamlet and several Indians, whereupon the other party also took their departure. Hamlet, who now persistently kept second or third place in the row, at once recognised the spot where he had got off the track, and showed it to us with a most miserable look on his face.

190. On the 13th May, we reached the crag where we had met the hunting party from Tuarutu, and a bad bout of fever forced me to choose it for a camp:—but when it came to lighting the fire, it turned out that Hamlet had left the last of the tinder-boxes at yesterday's camp. It was only the assurance of the Indians to help us quickly out of the difficulty, that could save Hamlet from many a sullen frown, for this was now the third or fourth box that through his carelessness had been left behind. I had already often enough heard that the Indians could light a fire without steel or stone, but the opportunity had always been wanting, of learning it by experience. Just as we take our tinder-boxes with us, so did our companions carry two "fire-sticks" with them. One of these pieces

was about the breadth of a man's finger and six inches in length: at about an inch from its extremity and bored through it was a conical hole into which the tip of the other piece, a rounded pencil, exactly fitted about half-way down. After the stick is laid on the ground and some tinder is placed under the opening, an Indian holds the piece of wood firmly in position there whilst another seizes the pencil (with its tip in the conical aperture) between the open palms of both hands, and quickly twirls it backwards and forwards, at the same time exerting a downward pressure on it: in the course of half a minute the so-called ant tinder placed below, catches fire. The tinder comes from the fibre-felt with which several species of ant line their burrows, and is obtained by them from a *Melostomacea.* The Indians always carry it about with them in a closed piece of bambu. Although we Europeans, as well as the mulattoes and negroes, often attempted to make fire by this method, our efforts nevertheless proved in vain, however much we twirled. The two pieces of wood, as I noticed later, were always cut from *Apeiba glabra* Aubl.

191. The flames of our fire had hardly begun to blaze, when the attention of our Indians was drawn to a noise in the bush close by. Bows and arrows were immediately picked up, and three or four sneaked warily onto the spot. I myself crept just as cautiously behind them though before I could make out the object in the thick Mimosa bushes from which the noise proceeded I already heard the twang of the bow-strings and the treble note of the escaping animal. The big commotion in the brush-wood, led me to believe that the game would break away where I was, which indeed proved to be the case. It was a giant armadillo that, pierced by two arrows, was exerting its supreme efforts in forcing a way through the thick scrub which the arrows repeatedly prevented it from doing. The call of the hunters quickly brought those left behind at the fire to our assistance when the terrified animal was surrounded and soon killed by blows with our clubs. It was the rare *Dasypus giganteus* Desm. Its length, including the tail, amounted to 5ft., its height 2¾ ft., and it weighed from 80 to 100 pounds. The armour consisted of irregular plates: the growth of hair on the body appeared sparse and thin: the claws were very powerful and long.. The Macusis called it Maourairma, the Wapisianas on the other hand Manura. In the course of a quarter of an hour it was stewing, already cut up in pieces, on pointed sticks over the fire, which blazed in bright flames owing to the trickling over of the fat. The taste of the flesh is very like that of a young sucking pig: unfortunately the violent bout of fever had so spoilt all my appetite that I could hardly enjoy a morsel of the unexpected dainty. My companions were still busy on their tasty meal when the sharp eyes of a Wapisiana again noticed something alive moving about in the savannah below: he quickly ran to the spot and soon returned carrying another but smaller armadillo by the tail. It was *Dasypus villosus* Desm. According to the statements of the Indians this species is particularly distinguished by a peculiar growth of hair that covers not only the body but also the plates on the back, is solely present in the savannahs, and for the most part lives on carrion for which reason it is not eaten by them, a characteristic that is ascribed only to this one species amongst the seven met with in Guiana. In some of the festival songs of the Wapisianas and Macusis, the Yassi,

as they call it, plays a prominent part, while nearly every refrain ends with the words: "And when I am dead, put me in the savannah, and the Yassi will come and bury me." A similar song according to Martius is customary among the Indians of the Rio Negro.

192. On the third day, half perishing from thirst, and myself dead tired, we reached our old night quarters on Mt. Aruatïntiku (Tiger Mountain) where we at least hoped still to find as much water as would quench our burning thirst, which in my case was increased to real torture on account of the fever-heat—yet even the very last drop had dried up. Half desperate I threw myself into my hammock while the others hurried away in search of the longed-for element, but after a two-hour tormenting wait, the last one returned without having found any. Necessity and pain then first led me to think of digging holes with cutlasses in places where water previously lay, by which means so much dirty and marshy fluid was collected by and by, that after straining it through a cloth we could at least moisten our parched mouths and relieve our agony.

193. On the following morning as we were crossing one of the woody oases, I heard in the distance a peculiar noise exactly resembling the sound of horses on the gallop, and which appeared to be coming closer and closer. Shouting "Poinka," the Indians got ready with their guns and bows, and awaited the oncoming of the disturbers of the peace, which soon turned out to be a huge pack of Kairuni (*Dicotyles labiatus*). As soon as it caught sight of us it stopped a moment in its wild course, made a noise similar to the grunting of our pigs, and prepared now for flight. With an awful clattering and gnashing of teeth, the troop rushed along in front of us. Astonished and chained to the spot by the extraordinary intermezzo on this otherwise peaceful journey of ours, I had at the first go-off forgotten all about shooting, and hearing no shot fired by my companions, was just about to rectify the omission, when the Indian standing next to me drew my weapon away, which only served to increase my astonishment still more: but the riddle was soon to be solved. When the major portion of the pack had passed by, and the stragglers were coming along, the guns and bows were brought into requisition, with the result that we secured four animals. Curiously enough our dogs kept just as quiet as we did, during the "march-past," and had lain down on the ground.

194. The Indians told me now that shooting into the middle of a pack was attended with the greatest danger owing to the animals then scattering themselves in all directions and in such a rout ripping to pieces and destroying with their tusks every object that comes in their way. Hamlet who, quivering and quaking, stood close to me, while the angry mob was tearing past, corroborated this statement by mentioning that his father had lost his life in the same way, having met his death from the wound received from a Kairuni after shooting into the middle of such an escaping crowd. If the stragglers are fired on, the main body continues unconcernedly on its course. When cutting up the quarry we found two sows far advanced in pregnancy, each with one young one.

195. To prevent the meat from spoiling, we exerted our utmost to reach the Wapisiana settlement at the foot of the Auuru-paru (Range). Shortly before entering, and in a small oasis our dogs started a glutton which they drove into the savannah, but from which it escaped as quickly as possible back into the oasis, and there into a hollow tree, where it was nevertheless killed by its pursuers. It was *Gulo barbarus,* a completely full-grown specimen. The length from tip of snout to root of tail amounted to 2¼ ft.: the tail itself measured 11½ inches. The white-grey head, as well as the yellowish-white patches on the breast, stood out in marked contrast with the brilliant black colouring of the rest of the pelt. As in the fox, there are two glands on its seat that contain a sickly-smelling moisture. I subsequently found tamed gluttons amongst the Indians. Their usual food consists of rats, mice, birds, insects, fruits, and honey: they lie in wait for the first mentioned just as our cats do. They are excellent climbers, and clamber up the highest trees to plunder birds' nests or to search for honey, and always climb down head first. They mostly go on the prowl during the day-time and sleep the night in hollow trees where they are said to litter three young. When pursued or irritated they raise up on end the hair of the tail. The Macusis called them Maikong, but the Arawaks Hacca. By 5 o'clock we had reached the wished-for settlement, whose aged occupants we once more found in their hammocks. The old man afflicted with dropsy, was still alive it is true, but judging from the lifeless eyes and difficulty in breathing, seemed to be only a few steps from the grave. His wife was squatting on the ground near the hammock and the imbecile boy at the fire under the death-bed: the latter, on noticing me enter, uttered some inarticulate sounds and rushed again to the darkest corner of the house. To recall the younger residents who were not present, I fired off my gun, producing thereby a faithful repetition of the previous state of uproar, and in the course of quarter of an hour they came in: during the interval our companions had already requisitioned the smoking-frames (boucans) that had been left from our previous stay. We had just exchanged reciprocal greetings when a loud shout drew both the young men and some of our party back again into the savannah. I was too exhausted to follow, although the word "Poinka" promised another performance of the Kairuni chase. The hunters soon brought in two animals, one of which I also found to be a sow pregnant with a full-grown youngster: June and July would seem to be the time when they drop. The superabundance of meat so unexpectedly falling to our lot naturally prevented the Indians from thinking at all about their hammocks or of sleep.

196. While we were just about to strike camp on the following morning, the young Indian was telling me that if I wanted to travel down the Takutu to Tenette, he could hire me for the purpose a corial that was large enough to carry not only myself and two paddles, but also a part of our baggage. My exhausted condition made the proposition very welcome: the others of the party would follow the road along the banks. After half-an-hour's march in a north-easterly direction we reached the Takutu. The bed of the river here was regularly filled up with granite boulders, between which the water forced its way through 3 to 4 ft. broad

channels, so that one could cross on this rocky dam to the opposite bank with dry feet. We found the promised corial so cranky and full of holes that I now wanted to change my mind, but active hands soon bailed out the water that had poured in, tried to prevent further inrush by stopping up the holes, and packed in the luggage. After the land-party had disappeared in the brushwood on the further shore, we floated our vessel. Although we struck no further rocks, I only too soon regretted having trusted myself to the frail craft, for the water shortly forced its way in to such an extent, while the two Indians were fully occupied with the paddles, that I could hardly bail it out quick enough. What embittered my perseverance still more, was the daily attack of fever that shook me up so badly during the tiresome efforts at bailing, that I was hardly conscious when we finally reached the mouth of the Cursorari, where we found the land-party already camped in the shade. They were engaged in cutting up a Tayassu (*Dicotyles torquatus*) which they had shot a little while before. This species never lives in large packs, but in the majority of cases is only present in pairs, it being one of those rare cases when one finds six to eight gathered in one spot.

197. The inrushing water having soaked several of my packages, their contents had first to be dried in the sun, before we could proceed on our way to Tenette. This was soon done, and exhausted with the fever, I now tottered towards the longed-for village. Already in the distance my attention had been drawn to a man amusing himself at shooting with a bow. I soon recognised Mr. Fryer skipping gaily along towards us, but who, when three paces off, stopped short with a puzzled air, he being hardly able to make me out, a mere skeleton, fatigued and emaciated by fever. Fryer was just as surprised at my appearance as I was depressed over the negative reply I received to the first question I asked as to whether he had any quinine.

198. Our friend, who had left Petri out of danger at Pirara, had been in Tenette for the past eight days, and as the residents could not accurately advise him as to our route, was determined to wait for us here where, as the luggage left behind indicated, we would have to return. To the enquiry about quinine, there naturally followed others concerning our friends in Pirara who at the time we left were daily expecting the arrival of a supply of provisions from Georgetown, to all of which I received more satisfactory answers than the first. A special pleasure was still in store for me. My feet, like my whole person, owing to 200 miles covered in sandals, had got into so desperate a state as to awaken Fryer's entire sympathies with the result that he gladly and willingly offered me the spare pair of shoes that he had brought from Pirara.

199. In order that we might find everything comfortable on our arrival at Pirara, Fryer made his way back there on the following morning. Next day brought us also the other party. From Tuarutu on, they had continued their course through wooded savannahs, reached Takutu towards evening, and crossed its approximately 80ft. wide dry bed on the large granite and gneiss boulders which actually filled it.

200. On the following day they traversed the highest elevation between the Rupununi and the Takutu, a spot about 150 feet above the level of both: the Rupununi lay 6 miles, and the Takutu 12 miles distant

from it. In the afternoon they reached in a N. 56° E. direction the Wapisiana village Cau-urua situate 2° 28′ 25″ lat. N.

201. As the bed of the Rupununi lay but 1½ miles from here in an E.N.Easterly direction, my brother went and found the river to be already a considerable stream with blackish coloured water, the sources of which, according to the Indians' statements, are distant a day's journey from there on a savannah in between a group of Mauritia palms. After the experiences we had had both on the Takutu, the Rupununi, the Demerara, and Barima, in connection with the colouration of the water at their sources, almost all the rivers of Guiana seem to possess this striking peculiarity, and it is therefore only to be expected that this will also be established in the case of those of the Orinoco. Alexander von Humboldt limits this strange phenomenon to the stretch of land between the fifth north and the second south parallels of latitude, but the water at the sources of the Barima although they lie much more northerly are nevertheless just as black as those of the Takutu and Rupununi.

202. On the 14th, after traversing the little stream Cau-urua and a trackless savannah, they crossed the Canaru River, the waters of which led to the Rupununi and reached a settlement situate on the slope of the Pinighette Range. The highest point of the Range running out into a pyramid, rose to some 900 feet. On the following morning they followed the valley watered by the Paiwu-yau, that courses between the Pinighette and Mamette Range, leaving Duruau,—some 2,500 ft. high, from which a complete cluster of hills, divided only by small passes, led in a west-by-north direction towards the Cursato Range—about a mile towards N. 15° E. Equally exhausted, as we had been, they finally arrived at Tenette on the 16th.

203. For the past 14 days the sky had periodically shown itself clouded, but the clear blue was now suddenly changed to a uniform grey, a sure sign of the approaching rainy season, which this year had been remarkably long in coming. The daily temperature from 16th to 18th May was at 6 a.m. 73°.25: at 9 a.m. 78°.17: at noon 85°, at 3 p.m. 88°.33 and at 6 p.m. 80°.33. On the 17th the first thunderstorm with heavy rain broke over Tenette.

204. During our absence, the Takutu had continued to dry up with the result that on the 18th May we had to make our way on foot to Pirara whither the Indians from Tuarutu accompanied us to have a look at the black soldiers. After a fatiguing march under the most violent rain-showers we finally reached the bank of the River Scabunk or Catu-auuru where we spent the night in a wooded oasis, and only after several fruitless attempts, succeeded in making fire to dry our clothes that had got wetted through. But previously to reaching the oasis our attention had been attracted to a number of 50-60 ft. high trees which appeared to be completely enveloped in a dark rose-blossomed covering:—they were not blossoms, however, but bracts which lent the tree this beautiful appearance. On the Rupununi we subsequently found the tree in blossom: it was a new *Calycophyllum* that was named *C. Stanleyanum*. Its lovely coloured bracts, in the *massif* of which the green leaves disappear almost

without a trace, make of the tree one of the grandest ornaments in a tropical landscape. A botanical exhibit, equally interesting for me, was a large number of trees of the *Mimosa acacioides* Benth., the Parica or Paricarama of the Indians: the British Guiana aborigines apply its seeds to the same purpose as the Otomacs and Guajibos of the Orinoco put the beans of *Acacia Niopo* Humb. Bonp., and as Asiatic peoples use opium. They pound the beans to a fine powder, burn it and inhale the smoke or else rub it into the eyes and ears. Either method soon puts them into a drunken and ecstatic condition lasting several hours, in its extreme degree bordering on madness, that is succeeded by a stage of great exhaustion and drowsiness.

205. Next morning, under a clear sky, we continued our way through the trackless savannah with the Takutu lying about 2 miles away on our left. Our course was directed to the western spur of the Canuku Range. During the afternoon we crossed the Sawara-auuru which, owing to its being so considerably swollen from yesterday's rains, could only be effected after overcoming the many difficulties placed in our way by the number of rounded quartz and granite boulders. The day was not yet sufficiently advanced to allow of our pitching camp just yet, and we therefore continued to push along: certainly, to our subsequent keen regret because, in spite of the showers of the day before, we searched for water in vain. We were so often deceived, particularly by a 1½ to 2 ft. high light green and bluish grass swaying in the breeze that is generally present in swampy situations, is spread over large areas, and exactly simulates a wavy water-surface, that we had already despaired of satisfying our cravings, when our patience was nevertheless rewarded by a pool, containing a liquid of almost thickened consistency, close to the foot of Curatawuiburi, on the western spur of the Canuku Range.

206. Thankful to find this darkish fluid, we pitched our camp under some *Curatella* and *Bowdichia* trees. Where the pool was still a bit deep, it was regularly crammed with a tasty fish, the *Erythrinus unitaeniatus* which thus became the easy victims of our companions. To this very welcome dish, I soon added a second dainty, namely a large quantity of honey. Several bees that were buzzing around had led the ever attentive Indians to make careful search of the neighbouring *Curatella* and *Bowdichia* trees, and a loud shout soon indicated that their efforts had not been in vain. These interesting honey-bees fix their often 2 to 3 ft. long nests which in substance and internal structure correspond fairly well with those of our wasps, to the branches of the trees. The cells within this paper building likewise consist of six-sided paper-like prisms and contain the larvae and the honey. The latter differs in its intense sweetness from the acidulous kind of the small stingless bee which builds its nest in hollow trees. The body of the about four-tenth inch-long insect is dark brown and thickly haired: its under-wings are black with rust-coloured edges, and the sting is extremely painful. The Macusis called the bee Wampang: the Wapisianas Camuiba. Our companions tied bundles of dried grass to a pole, set them alight, and held them under the nests so that the dangerous owners might be driven off by the smoke. The larvae were just as great a delicacy to the Indians as the honey was

to us. In April and May the cells seem to be mostly filled with honey. The stingless bee already mentioned builds its nest in hollow trees and collects wax at the same time. The often six-inch-long funnel-shaped entrance to the nest is formed of a mixture of wax and clay. The black wax, the colour of which cannot be removed by any manipulation whatever, is used by the Indians as a covering for their hunting quivers (Muyeh) and for lights. The Macusis called this species Mapa.

207. The following morning was to greet us once more with one of those fairy-like tropical landscapes, to which the eye of the Northerner clings at first with so much wonder, until finally his dumb transport finds expression in exclamations of surprise. In the middle of a distant savannah ahead of us there rose to a height of about 150 ft. a sparsely wooded isolated hill with innumerable white spots sparkling through its dark and refreshingly verdant carpeting. Huge granite boulders hemmed in its base, along which our way led, covered the slopes and crowned its top, while in between them hundreds of *Agave vivipara*, alternating with isolated forest trees, shot up their blossom-bedecked candelabra-like flower-stalks: some of these were often 40 to 50 ft. high, and mostly two feet thick below. We had lain ourselves down with a view to appreciating the beauty of this fairy structure to its fullest extent, when fever again attacked me and only allowed of our resuming the journey after some hours' delay.

208. After travelling round the western spur of the thickly forested Canuku Range we followed the northern slope to a distance of from one to two miles through thick Palm, *Musacea, Zingiberacea* and *Cannacea*-woodlands, crossed the little stream Maripa-outé that received its name from the innumerable quantity of *Maximilia regia* bordering its edges, the Macusis calling the fruit Maripa, when we came upon a small savannah where, in the midst of the most luxuriant growth we saw the sombre charred ruins of a demolished village that openly bewailed a Brazilian slave-raid. On our right and far beyond the dark mass of vegetation, rose the steep rocky crags of Ilamikipang and recalled to memory the happy moments that I spent there. Dense forest soon enveloped us once more until we struck a second village, where my brother had spent several days in 1838, and which since then the Brazilians had apparently razed to the ground. In the evening we reached Curatu-kiu, where in the meantime changes had also taken place. In vain I sought for the hut of the old chap who prepared the poison: a fresh fire-place and the heaped-up mound within showed where the bones of the most celebrated poison-mixer of the Macusis were resting. Instead of the previous tidiness that distinguished his feared laboratory, there now reigned the greatest disorder: funnels, pots, and supplies of Urari bark lay scattered higgledy-piggledy, and with his death the spell surrounding the spot seemed to have departed, for without fear or fright, old and young passed in and out of the building, now used for a different purpose: we silently hung up our hammocks inside for the night.

209. Intent on still reaching Pirara in the day, we set out on the following morning well before dawn, because 28 miles under a tropical sun constitute an unusual and extremely fatiguing walk. On the other

side of the isolated building where I had spent the night on my journey to Ilamikipang, we came upon a savannah absolutely bare of bush and trees and, at several spots, even devoid of every trace of vegetation. It almost seemed as if Sun and Thirst wanted us to experience once more the pangs with which they had so frequently afflicted us during this same trip. Towards noon, the thermometer registered 124° F. a temperature all the more oppressive considering that our path for a long while led continuously over sharply-pointed and hot quartz and conglomerate fragments, we searching in vain for the comforting sight of water. The Indians hurried to every depression that showed itself in the ordinarily level surface, but on each occasion returned weary and disheartened: even the bed of the Nappi showed nothing but innumerable empty shells of the *Ampullaria guianensis.* Finally, in a depression in the channel of the Quayé we came across a dirty, thick, green, muddy mass of stuff that had been fouled by animals and birds, and at the same time seemed the favourite resort of a number of frogs and toads, for which reason we had first of all to strain the fluid through a towel:—but even then it was too bitter to drink and just as we could not even moisten our mouths with it so also did the dogs draw back when they went to get their fill. The sight of some houses on a hill to the eastward, allowed of our raising no objections to a circuit of several hours and a pathway through 6-8 ft. high sedge-like grass:—for water must of course be there. But even before reaching them, our burning thirst was satisfied. At the foot of the hill on which the settlement was situate, the villagers had dug several deep holes which, even if sparsely, contained the water yearned for. Everybody eagerly bailed at the cooling drink: the dogs were not to be restrained either by their master's voice or by sticks, but jumped straight into the pits and quenched their own thirst before we could allay ours.

210. In the huts we found a solitary but friendly house-wife who immediately set before us fresh cassava-bread and pepper-pot filled with the tasty flesh of the Hokko-hen. The men had gone to Pirara to assist with the transport of the baggage which the army-boat had brought up from Georgetown. All drudgeries of the day were forgotten with these welcome tidings, our very letters from home were now awaiting us, in short everything that soul and body longed for. With an hour's rest we were again upon the road, to spend the night at Awarra village, for our feet refused us further service. We had traversed to-day a distance of 20 miles over an open savannah under a temperature of 120° F.

211. As several of our companions belonged to Awarra, our arrival caused the most genuine excitement, old and young coming along to welcome their dependents: full of smiles and cup in hand, the women hurried to their long-absent husbands, the latter not moving so much as a muscle of their features. Taciturn and unconcerned, they took the calabashes which, after emptying, they returned without so much as a word or handshake: just as silently they discharged their loads out of which the hammock was straightway rolled. Slung in its old place, the inexorable lord and master threw himself into it and regarded with indifference the wife's face beaming with happiness, and the noisy kiddies capering around their

daddy, now returned and resting. In spite of this apparent want of warmth the husband's and father's heart beats within just as warmly as with us, but Pride prompts the Indian—who, when free from observation is as capable of indulging in these feelings as extravagantly as any European—to strive against exposing them in the presence of strangers. How often, later on, have I not been the unnoticed witness of such a scene! So long as any of us was in the neighbourhood of the house when such a return took place, the husband had neither a word for his wife nor for his joyous children:—for the latter, at best, a reproachful look that they were not masters of their feelings. The men enter the houses quietly, throw themselves in their hammocks, take the calabash which the wife brings them, reply to her query "Have you come," at most with a "I am here," and only when we were at a distance and the drink had effected its purpose, did they relate the adventurous happenings on their journey.

212. Several men had also hastened from Awarra to Pirara to assist in the transport of the stores to the Station. The 22nd May was a Sunday, and so as to get to Pirara before the commencement of Divine Service, the rising sun found us already half way on the journey. Towards eight o'clock we reached the great oases that stretching south of Pirara were still hiding it from our view, and had hardly made our way through and shouted our hearty and joyous "Welcome" to the friendly village as well as to the Fort, when twenty cannon shots roared at us in return. The people had noticed us from there as soon as we emerged, and by this salute wanted us to recognise how glad they were at our return. The noisy greeting changed hitherto quiet Pirara into an excited ant hill, and soon Mr. Youd and Fryer welcomed us to the village which had become quite changed during our absence. The number of occupants like the houses had increased in equal proportion, and, good gracious! almost the whole female portion of them came to meet us with a clean outfit and with hair neatly combed and plaited. What the late Mrs. Youd had previously taught the buckwomen in the neighbourhood, was not forgotten, the print brought by Mr. Youd was quickly made into clothes, and the broad many-pleated skirt reaching from hip to knee uncommonly enhanced the natural charm of the young and mostly beautiful figures. The pullers who had come with the provision boat from Georgetown lent a good deal besides to the unusual liveliness.

213. In the midst of the first welcome's rejoicings a fresh attack of fever drove me to the medicine chest with a view to overthrowing its hitherto unquestionable mastery by a dose of 18 grains of quinine. Poor Petri, with his arm in a sling, also came to greet us: he still appeared miserable enough. The wound continued open, and as complete healing was out of the question up here, it was decided that he should return to Georgetown with the military boat and stay in Hospital until recovered and cured.

214. We had been exactly two months away from Pirara, and had traversed over 500 miles, but in spite of the unusual heat and exertion, no one had been really sick except Petri and myself with my 32 attacks

of fever: besides this, except for one thermometer, none of the astronomical instruments had suffered damage.

215. Hardly had we taken possession of our dwelling when the whole body of officers, increased by one through the arrival of a young doctor, now came along and greeting us with a hearty handshake delivered a whole packet of letters from home and newspapers from Georgetown. Mr. Bolby, the new surgeon, was of course unable to answer our enquiries concerning this or that person in town, because immediately after his arrival in the capital he had been obliged to leave it again and accompany the commissariat forces to Pirara. Our friends from the Fort had all the more news to give us but amongst it little that was pleasant: worse than everything else was the information that the Brazilians were making active preparations to wash out the disgrace offered them by our taking possession of Pirara. The Militia of the Rio Negro and Rio Branco were already called up, two regiments of the regular troops were on the march here from Para, and the garrison of Fort Sao Joaquim was by this time strengthened by the forces from the nearest fortress on the Rio Negro. Although the Commandant of Fort Sao Joaquim during our absence had expressed his friendly intentions on the occasion of many a visit, and duly continued to carry on undisturbed his profitable trade in cattle, provisions, and ethnological specimens—especially in feather ornaments from the Mundrucus, Guinaus, and Pauixanas living on the Parima and Rio Branco—this could nevertheless not last much longer because the oncoming military forces would soon raise an insurmountable barrier in the way of amicable relations. Friar José dos Santos Innocentes not only continued the alluring traffic with the enemy in his own person, but carried it on even more actively through his amanuensis Aberisto,—and could anyone blame the poor devils? Captain Antonio de Barros Leal, as he complained to the officers, had received no pay for four years, his garrison at the Fort for three years, and poor Father José nothing for ten years. What wonder then that they willingly seized the opportunity of emptying the full pockets of the enemy. Unfortunately the poor Commandant was shortly after charged in Para by a low lot of subordinate officers with having sold the enemy not only horses and cows but also provisions: the loss of his captaincy followed. Notwithstanding that our black heroes were inspired with the best of courage, and after subsequently seeing and learning to know the woeful figures of the Brazilian military, I was convinced that each of our Negroes could try concinsions with any four of them.

216. After the officers had left, we ravenously fell upon our letters and spent real hours of joy and pleasure in reading them over and over again. We certainly had to proceed more cautiously with the perusal of the newspapers, because the long monotonous rainy season of three months' duration was near at hand, and an economical distribution of the already stale news was accordingly all the more advisable.

217. The Fort greeted the morning of 24th May, the birthday of Queen Victoria, with a salvo of artillery. All its own and Pirara's flags

flew gaily in the fresh matutinal breeze and our small mortars as well as several explosive charges that had been mixed the day previous for the purpose, returned the deafening salute. Everything was en fête. A bright lunch, for all of us in common, at which a large gap was made in the stock of wine received by the officers, the distribution of a double ration of rum to the garrison, and a single one to the inhabitants of Pirara, served to make the day, as well as the evening, with a fire-work display, one of the most cheerful that Pirara had ever seen. Curiously enough this happy and exuberant disposition remained in evidence on the next day also, among that portion of the brown population, just then engaged in transporting rum-casks from the landing-place of the Rupununi to the Fort, and as we ourselves noticed some few drunken Indians even after the completion of work, there could be no manner of doubt that they had become thieves. In the meanwhile we were unable to discuss punishment, until the stolen goods could be found on them—goods which, according to Commissary Low's statement, it was impossible to have come from the casks, because he had found these all full, and without any trace of an opening. The rowdy noise going on at night in the houses indicated who the Bacchanalians were, but the boys set around the buildings as watchmen, made it impossible for us to sneak up to and upon them *corpus delicti*. For several days all attempts at discovery turned out to be futile: even the promises made proved fruitless until finally Mr. Youd came upon the tracks of the fraud. Unfortunately, his secretary, Godfrey, an intelligent young Indian, who had been educated in Bartika Grove and had followed him to Waraputa where he had assisted him in teaching, turned out to be the instigator of the larceny. Upon his instructions, the Indians had bored a hole with iron nails in top and bottom of every cask, so as to let the rum run out, and fill one bottle after another with it: the decimated casks were again filled with water and the holes then so masterfully plugged with wax, that they had escaped even the sharp eyes of Mr. Low. The greatest part of the booty naturally fell to the lot of the cunning ringleader, who up to the very moment of his repentant confession, was carrying on a lucrative trade in the neighbouring villages, where a quantity of the money that had been paid in wages for the transport was to be found. A considerable proportion of the inhabitants of Pirara and of remaining settlements in the neighbourhood had bought up the stolen cordial: and yet the robbery was carried out by the smart fellow with the assistance of only a few partners.

218. Eight days after our return, the boat and in it poor Petri returned to Georgetown while with each day the grey monotonous months drew near, and the Indians hastened to plant up their recently cleared provision-fields before the full rainy season should yet set in. This period of planting and sowing, is called Timong-pohti by the Macusis: the dry season on the other hand Awi-na.

CHAPTER IV.

Setting in of the Rainy Season—Swarming of, and gathering the Termes destructor and Atta cephalotes—Phanaeus Jasius and Mimas—Meteorological observations—Getting the houses ready for the wet season—Moisture of the temperature and of the ground—Return of Hamlet to Georgetown—Despatch of Hendrick and Reuter there—Enumeration of the troublesome and dangerous animals that the rainy season drives into the houses—Flora of the rainy season at Pirara—Visit from Brazilians—Blighted hopes of a broken fast—Influence of the atmosphere on the lives of the Indians—Youd's Recall—His departure for London—His death, and its consequences for Pirara—Treatment of snake-bite by the Indians—Meteorological observations from May to August—Return of Hendrick and Reuter from Georgetown—Recall of the Military—Dismissal and death of Reuter—Manatus americanus—Baru—Demolition of Fort New Guinea—Another excursion to the Canuku Ranges—Coracina militaris.

219. The harbingers of the rainy season (the Conno of the Macusi) were becoming more numerous. With the vivid summer lightning that mostly played all night and covered the whole cupola of Heaven with an almost continuous phosphorescent blaze, was soon joined the appearance of three kinds of winged ants. Of these, the female insects when roasted, were regarded as very great delicacies by the Indians, on which account the gathering of them afforded plenty of occupation to both old and young. Though, like swallows with us, they only appeared singly at first, the swarms of *Termes destructor* (Woodlouse of the Colonists) multiplied daily in increasing proportion and were finally borne on the air like heavy rain-clouds, to become when fallen to earth, the prey of the ugly lizard *Ecphymotes torquatus*, as well as of two other kinds of ant, of several birds, and particularly of Indians.

220. The winged insects having left their ant-hills in the savannah, the whole village population, all making a row and shouting, betakes itself each evening to the edge of the neighbouring wooded oases, where they light huge fires around which the ants will swarm in ever-decreasing circles until, what with wings singed and burnt, they are collected by the noisy crowd in drinking cups or small baskets. I never missed these trips: they had a peculiar fascination for me for it was the most illusive realisation of the Brocken scene in Goethe's Faust or the Saga of the Harz, when the nude brown figures, young and old, would caper wildly around the huge bonfires, and at the same time raise their voices, which to my German ear seemed to represent the unbridled gambols of a crowd of underground hobgoblins rather than those of my fellow brothers and sisters.

221. The winged males and females of the *Atta cephalotes* supply the greatest tit-bits. If here and there an isolated specimen of these large creatures lets itself be noticed on the wing the fortunate observer forthwith sounds the alarm through the village, and everyone that can run, rushes along with palm-fronds or other bushes, to the well-known hilly mounds in the forest which are now encircled by the women. The sharp tweezer-like mandibles, with which the females as well as male insects are provided, would scare any European, but not the Indians, for without bothering about their numerous bites the women seize in their already bleeding hands every one of the winged ants as they creep out of their tunnels. Should a specimen escape there are the boys standing by with their palm-leaf or bush ready to knock it down. Once caught the head is torn off and the abdomen, full of a mass of fat, then roasted or boiled: so prepared it is regarded as an even greater delicacy than the larva of the *Calandra palmarum.*

222. To these harbingers of the rainy season culled from the order Hymenoptera must be added the equally innumerable representatives of the Coleoptera, particularly those of the family Scarabaeidae, of which the genera *Phanaeus* and *Copris* appeared in immense numbers with the first rains. *Phanaeus Mimas* Fab. is as much the most infallible indication of the opening of the rainy season as the less beautiful *P. Jasius* Ol. Among the species of *Copris* which I collected on this occasion, were found two new species: *Copris coenosa* Erichson and *C. quadrata* Erichson. The rapidity with which *Phanaeus Mimas* and *P. Jasius* collect on a dead animal or on a piece of flesh is just as remarkable as the quickness with which they can bury either. The body of the biggest bird I ever threw away after skinning was sunk in the course of a quarter of an hour, notwithstanding the ground was fairly hard. Scarcely is a carcass cast aside, than they come flying from all directions like crows, settle down close to the welcome carrion, creep under it and begin to mine, until after but a short interlude a small heap of loose earth indicates the spot where Death becomes the fruitful source of Life. It was only very rarely that I noticed *P. Mimas* on the coast.

223. The commencing rainy season, however, was indicated not only by sight but also by ear in sounds that had never been previously heard. From sunset to sunrise numbers and numbers of tree- and other frogs, toads and similar creatures, assisted by goat-suckers and savannah owls pitched their melancholy, but more than shrill, notes at us from out of Lake Amucu.

224. Though we had already spent a rainy season on the Orinoco and Barima our range of vision had been limited owing to the dense virgin forest surrounding us: but here the free, open, and extensive savannah put no restrictions on our observations upon its accompanying phenomena.

225. The hitherto prevailing easterly wind changed suddenly into an almost continuous westerly or north-westerly one, driving in front of it the dark and dismal clouds of which some burst their limits, while others rested like black walls on the distant Canuku and Pacaraima Ranges. Even if now and again the sun did rise bright and clear of a

morning, there soon, however, formed from out of its small accompanying clouds a gloomy grey-black bank practically resting upon the savannah, where, subsequent to a violent gale, it overfloods the ground, which, being already saturated, cannot absorb any further additions. The copious and violent showers had already at the beginning of June turned into the most dreadful and really horrible storm-clouds: several such would often tower up to Heaven at the same time, and gradually approaching one another, notify their junction with a continuous roll of thunder. These awful scenes usually began in the afternoon, were re-enacted at midnight and heralded the break of day: the last were always the most terrifying and during their continuance almost incredible quantities of water fell to the accompaniment of the most frightful thunder-claps. The dawn, naturally not quite broken already, turned usually into darkness, which was only rent by the dazzling forked lightning. As weather like this often kept up for hours, the quantity of rain falling amounted to mostly 3-4 inches: never, however, did we see the lightning flash start a fire.

226. From the beginning of June to a greater or less degree this dreadful spectacle repeated itself almost daily: like the sun, we very rarely at this period got to see the moon, and then only in a diaphanous veil.

227. Our two houses, of which one was occupied by my brother, and the other by Mr. Goodall, Fryer, and myself, could not withstand weather of this description well enough at least for us and had to be not only a good deal repaired but specially fitted up in a style more convenient than that what Indian comfort desires on one's premises. The thatching of both was first of all renewed to withstand the rain, and some openings then made in the mud walls to admit some light. The boards that had served as seats in Friar José's church, and were sawn from the beautiful wood of the Poa da rainka (*Ormosia hystiophylla*, Klotzsch) proved of considerable help in building up the furniture which might not of course excel in elegance the work of this description manufactured by the late Mr. Robinson. Though the interior looked fairly habitable it had also acquired a certain erudite appearance because one side wall was occupied with a large frame on which were piled all the treasures I had collected, to save them from the inconceivable moisture of the ground, while across the adjoining one was stretched a lighter frame for drying the plants and botanical papers: as this could only be effected by the heat from the fire it gave me plenty of worry and trouble. In Europe it is an easy matter to set up an Herbarium, but, within the Tropics, to preserve during the wet season a collection that has been established during the dry, borders closely on one of the labours of Sisyphus.

228. In spite of the dam that we had thrown up around our houses and the trenches that had been dug, the mass of water pouring down during the night nevertheless overflowed our dwellings more than once to such an extent as to turn the dam into a dyke and our house into a small lake, which now and again naturally received a tributary from the roof. While still engaged with the improvements on our winter quarters we were awakened out of our sleep one night by the clear voice of

Hendrick who, now completely restored, had just arrived in company with some Indians from Maripa. As the waters of the Takutu had already risen considerably owing to the continued rains, he and his companions had been able to use our corial and travel down in it to the mouth of the Pirara. He was prodigal in his praise for the Maripa villagers who up to the last moment had looked after him with the greatest love and care: indeed, so as to strictly fulfil the promise given to my brother, some of them had even accompanied him as far as Pirara. Richly rewarded, these returned to their village on the following morning. Hendrick's stay in Pirara was but of short duration as our supply of provisions and "trade" was almost exhausted and, with the commencement of the dry season a start would have to be made on the most important object of our expedition, but this was only possible with a considerable supply of both. Hendrick and Reuter, the boathand, were the only two of our people who could be sent to Georgetown to bring back fresh provisions and trade in the big boat Victoria that the paddlers had gone down in. I despatched a considerable consignment of Orchids and other living plants to Mr. Bach, who had kindly promised to forward them on to Berlin—where they unfortunately arrived completely spoilt. Hamlet was also packed off. Soon after our return to Pirara I missed a parcel of beads, and then other things disappeared, amongst them a tin case of powder, while Hamlet's supply of spun cotton visibly increased. At first, suspicion fell upon the Indians, till finally the cunning Stöckle, who had made it his business to discover the thief, found the incriminating tin amongst Hamlet's effects, as well as the Indian who had given him a considerable quantity of spun cotton for its contents. From that moment, Hamlet's hours with us were numbered: he returned with Hendrick and Reuter to Georgetown as an outcast.

229. In consequence of the continued showers of rain, we soon saw the mythical old Lake Parima spreading out before us, while the raging storm quickly whipped the roused and rolling waves over the tall sedges and grasses till they broke on one of the wooded oases, which emerged like fruitful islands out of the now almost boundless flats. On account of their size two of these oases—without doubt the "Islas Ipomucenas" of Don Antonio Santos—specially strike the eye of the observer.

230. From the time that the outer environs of Pirara began to be changed by these water-flats, a complete alteration had taken place in the animal world. An entirely new creation of hitherto unknown insects, particularly blood-sucking Diptera, as well as other uncomfortable guests, commenced making a regular purgatory of our lodgings. Swarms of sandflies that had hitherto remained far remote from the peaceful settlement tortured us by day, while thousands of mosquitoes punished us by night: accompanying them, to our bitter cost, was the midge with blue thorax, white tarsal end-joints, and long sucking proboscis that pierces even the thickest clothing. But with these less dangerous than tormenting disturbers of the peace there yet came a number of rattlesnakes and other vipers which the cold and wet drove out of the savannah to the higher levels and especially to the house-thatch where they sought a dry and warmer spot for the rainy season. During this period we

killed in our own house alone, five rattlesnakes, and four ground-snakes, in addition to a large number of vipers: as a matter of fact, even the ditches and ramparts at the Fort could not protect the officers and men from these dangerous visitors. Dr. Bolby, who was one morning taking an article down from a small stand, seized something icy-cold, and drawing back in terror, now noticed that a large *Trigonocephalus atrox* had taken up its quarters there: the latter seemed to have been just as much frightened at the unexpected interruption as the doctor, because it tried to make its speediest escape into the neighbouring thatch which a powerful cut, however, rendered it impossible of doing. Were rattlesnakes less slow to act, no one, owing to their large numbers, would be able to live in the savannah. As the snake usually lies rolled up under the grass, and the rattling noise, produced when in motion, is too insignificant to be distinctly heard except on making its way over ground devoid of grass and bush, we were always forced to proceed with the utmost caution.

231. But still more loathsome were the numerous visits of the ugly and repulsive Geckoes (Wood-slave of the Colonists), which since the beginning of the wet season gathered in really immense numbers on the walls, rafters, and in the roof itself. They were particularly *Hemidactylus mabouia* Cuv., and *Platydactylus theconyx* Dum. The Indians and mulattoes fight just as shy of these creatures, as they do of snakes, because they generally reckon them to be poisonous.* When, so they told us, such an animal falls from the ceiling or from the rafters of the roof on to the bare skin of a person, the toe-webs that contain the poison (the sticky moisture exuding from them) become relaxed and press into the victim's flesh whence a swelling results that is speedily followed by death. This superstition is prevalent even amongst the Colonists, and the Wood-slave, like snakes and scorpions, is one of those animals that they are most afraid of. The adroitness and agility with which this creature can run up the walls, even along the smoother beams or rafters, borders on the marvellous. Just as peculiar are its nodding head-movements, which one particularly notices when sitting still. Hardly had we lighted our miserable lamp of an evening, than they would turn out to the not infrequent accompaniment of their unpleasantly audible notes, and start hunting for mosquitoes and other insects. The terrible accounts given us by the Indians had made the probably harmless creature hateful to us, and if now and again, when gathered together of an evening, such a visitor fell right in the middle of us down on to the table—an accident however that, owing to its unsociable habit did not too often happen, for it was ever snapping and hunting—this usually resulted in the immediate dispersal of the company: indeed, the loathsomeness we all felt for the ugly creature, never allowed of us lying unclothed in our hammocks. With these ugly animals there also cropped up a number of toads (*Bufo agua* Daud.) which the rain, as if by magic, had brought into the house. While

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* The belief that the bite of the Gecko is poisonous is prevalent also in Peru, according to von Tschudi. Reiseskizzen aus den Jahren 1836–42. von Tschudi Vol. I p. 326.

during the day they stowed themselves in the dark corners, of which there was a fairly large number consequent on the many trunks and boxes, underneath which they had dug regular excavations, they commenced rambling for food at nightfall. It was surprising that these unpleasant guests should be especially fond of pitching their camp between the bottles, jugs, and other water vessels, considering that they had fled from the moisture of the savannah. Were we to move aside a box that perhaps was not quite flush with the ground, usually whole nests of toads, geckos, lizards, scorpions, snakes, and scolopendras would be frightened out of the comfortable daily rest in which they were peacefully indulging. Such a throng of naked, swarming, loathsome vermin sent a real shudder through us at first, until force of habit made us forget our weakness and a stiff blow proved the best cure for these uninvited guests. In the houses occupied by the Indians it was only the roof that offered the sought-for lurking places, and so the intruders were much more easily discovered and destroyed here. We, on the other hand, could say in the true sense of the expression that we shared our quarters with toads, reptiles, and other vermin. Shoes, trousers, or, to put it shortly, every article of clothing had to be carefully examined first thing in the morning, so that when put on, we might have no truck with partners of that nature. It was especially the mice among mammals and, moreover, the innumerable species of ants, that gave me many a restless hour on account of their destructive fury, and many a racking brain to protect my collections from their punitive powers.. Among the ants a quite diminutive species that during the dry season had never been noticed in the house, now specially distinguished itself by appearing in regular swarms, and apparently aiming particularly at my insects. Associated with these was a second and still smaller kind that developed an unfortunate activity markedly during the night. Each morning we learned anew that all our precautionary measures adopted the day before had proved insufficient to paralyse their outrageous efforts. Even if we slung our insect boxes on cords strongly smeared with arsenical soap, or left every fresh bird-skin hanging separately in the air, on a similar thread, every effort was, and remained, fruitless:—their destructive effects showed in the morning that they had nevertheless found their way to them. Nothing proved secure from them —except the cassava bread and dried skins.

232. Another ant, a red one, larger than both those mentioned, was less partial to our collections than troublesome to ourselves personally. Before these had yet appeared, they had already settled in the ground at our fire-place, and woe betide him who came too close to their nest of an evening, for their painful bites would remind him of their *Noli me tangere* with more than wished-for distinctness. However unpleasant the insect was for us, it had at least one good quality, namely that it exercised an excellent sanitary police service. No dead insect or piece of flesh, even the smallest, escaped them. Hardly did anything of this kind lie on the ground than a procession of insects, provided with the finest olfactory nerves, appeared out of the nest and dragged the corpse inside.

233. Only one of these boarders that knew how to command continual respect on account of its powerful sting, though it was fortunately only exercised when disturbed, afforded me plenty of diversion during the gloomy days when our only resources lay within the narrow confines of our quarters. It was a large wasp (*Sphex pennsylvanica*). Immediately upon the commencement of the rainy season this hustling insect appeared on our premises, settled on the ground and actively sought a spot suitable for its nest. When this had been found, it commenced digging a round hole with the help of its mandibles and feet, and judging from the little heap of earth that it shovelled out behind this must have been fairly deep, as was indeed found to be the case on closer investigation. Hardly were the mining operations completed than the busy creature flew out of the house, to return after a short time with a spoil at least five times as big as itself—a grass-hopper of the genus *Conocephalus*—to which it held fast with both mandibles and feet: laying it down here the wasp disappeared inside the excavation, but soon showed up again to drag its victim into the entrance, during the course of which manoeuvres a number of difficulties and obstacles were overcome. Hardly was this business completed, and the ever restless creature already flown out of the house, than, laden afresh a few minutes later it recommenced the same tiresome work. It was most astonishing to me that although eight at least of these busy creatures had excavated their "Lying-in rooms" in our premises, and each returned quite eight times a day laden with spoil, they nevertheless dragged along no other insect besides the kind mentioned, one that I had only very rarely noticed in the savannah.

234. If I removed the heedful mother's spoils during her absence in the pit she subjected the house on her return to the most rigorous search, and then only would she fly away on her next murder case. When the hole was full of corpses, she laid her eggs:—the maggots creeping out found nourishment, but the caring mother disappeared to be seen no more.

235. We had now to spend four months in such company. This far from comforting prospect would be now and then cheered by a fine and pleasant day, when we would hurry from our cramped and darkened quarters out into the free and open world that had now almost become foreign to us. The Tropics also have their Spring-time, their virgin days of May, and though the vegetation there does not sleep beneath a stiffening coverlet of ice and snow, the scorching breath of the dry season nevertheless wafts over it a yellow-grey covering that offers to the eye, particularly on the broad savannah, a much gloomier picture than does the blazing and radiant snowy one of the North. Whereas in this case, the warm southerly breeze and the spring sun's early relaxing rays only let this melt away but gradually, and allow the sprouting shoots and swelling leaf-buds to peep into the unaccustomed atmosphere but timidly and slowly, the first downpour of rain is in the tropics the mighty magic spell that calls the expiring verdure back to life. A refreshing green which, in beauty and vigour yielded nothing to that of the North, enveloped all the higher situations of the savannah, and plants whose blossoms I had

previously sought in vain now smiled at me in wanton fulness. Particuarly noticeable amongst such were the *Clitoria, Marica, Hibiscus,* several *Melastoma* and *Phaseolus*; the glorious *Amasonia erecta* Linn. fil., *Pavonia speciosa, Evolvulus sericeus* Sw. and *E. glomeratus* N. ab E.; the equally lovely *Neurocarpum longifolium,* whose beautiful blossoms formed a pleasant break in the green savannah carpet to which a good deal was contributed by the small *Myrtacea* bushes covered with white flowers; the *Bignonia* bathed in red; the peculiar *Amphilophium paniculatum*; and a wonderful *Alstroemeria* that proved a new species, *Alstroemeria* (*Bomarea*) *fuscata* Klotzsch. On the other hand a white girdle of the *Jonidium Itoubou* Humb. Bonp. so peculiar in the form of its blossoms, and of the existence of which until now, owing to its withering away during the dry season, I had not even had a presentiment surrounded the edges of the wooded oases. The Brazilians employ the roots under the name of Praya da proia or Praya bianca as a remedy for diarrhoea, and at the same time sell it as real Ipecacuanha because of its producing similar results.

236. Even in Pirara, the seeds brought to germination by the wet, grew in such marvellous profusion that the settlement otherwise kept so clean became a regular pasture. Especially conspicuous were *Synedrella nodiflora* Gaertn. and *Porophyllum ellipticum* Cass. that covered the village gounds like a felt over which the *Passiflora foetida* stretched its long tendrils, while the different greens of a number of grasses such as the *Cleoma guianensis* Aubl., *Cissampelos subcrenata* Klotzsch, and several *Solanum, Mimosa* and *Cassia* supplied an extremely varied colouration. Even the small hitherto leafless cotton shrubs around Pirara had put on a new dress.

237. With the sprouting of these plants, however, there appeared a new tit-bit for the Indian, a caterpillar, which, according to its marking had much resemblance to that of our Cabbage-white (*Tachyptera brassicae.*) They again disappeared just as quickly as they came, for within 8 to 12 days they had already completed their period of growth and changed into a chrysalis. These caterpillars and chrysalids were collected and devoured by old and young quite as industriously and keenly as the winged ants. So as to provide the father and mother with dessert at the mid-day meal, the children would shew themselves especially keen at gathering them, during the course of which these caterpillars with a piece of cassava bread would be stuck in such quantities in their mouths, that the overflow of the disgusting juice ran down out at the corners. When the little boys and girls with their bit of cassava went off in the morning accompanied by their monkeys to the fruitful field of their choice tit-bit, there was as little difference between the industry of the former and that of the latter, as when the female occupants of the houses, sitting one behind the other searched their hair for game, and instantly crushed between their teeth each morsel as it was caught. Each country has its own customs.

238. While the damp and sultry atmosphere thus called to life real wonders in the vegetable kingdom, it exerted in the very opposite sense

a most relaxing influence upon mind and body, and as a matter of fact to such an extent that we often became a burden to ourselves. A few hours' continuous labour usually rendered us quite unfit for further effort. The day was generally brought to a close by writing up the diary, or with the inspecting and looking after the collections, but oh! those long, long evenings, when we could not sleep at all because every moment our rest would be broken by the continual pinching and nipping, twitching and sticking, cutting and biting of our innumerable tormentors, while, as to the newspapers—well, they had already been read three or four times through. The officers of the Fort who were troubled with the same worries, just as vainly sought a remedy in our company as we did in theirs. Yes, it is indeed a monotonously slow game, a tropical winter like this when even the most inventive spirit has to recognise itself bankrupt. The intense longing for the pleasant winter days of Home with their clear blue sky and their white covering of snow was accordingly awakened with redoubled energy.

239. It was while we were sitting together one evening, grumbling and growling as usual, that Bingham all of a sudden wonderingly enquired why we didn't try and shorten these dull evenings with a game of whist? We gladly seized on the idea, but where to get the cards from? Mr. Goodall soon knew how to put the suggestion into practice. His sketching-portfolio still contained a quantity of Bristol paper, and under his dexterous hand it did not take long to produce two packs of cards, the faces of which represented the members of the expedition and of the Indians befriending us, the latter recognisable by some peculiarity or other. The officers at the Fort would come over to us at Pirara for a week: the following week we went over to them. Rembrandt could have found no worthier subject for his brush than the interior of one of our houses on such an evening's entertainment. The little lamp, scantily fed on turtle-fat or palm-oil and giving a bluish flame, could hardly light up the rough table which, in addition to the players almost returned to a state of nature, was surrounded by a number of Indians. These stared in astonishment at our movements and methods, proceedings so inexplicable to them,—throwing down the coloured cards and gathering them up again—until they finally shook their heads and betook themselves to a distance, or when they saw the player in the lead with a despairing woe-begone look suddenly throw his cards on the table and convulsively smack some portion or other of his tortured anatomy to kill the blood-sucking mosquitoes that were making him forget all about honours and over-trumping. But still more interesting must the moment have been to the apathetic on-lookers, when the terrifying shout of "Snake" was heard. As with a word of command, the whole company then stood upon the table, the chairs, or upon the boxes close by, whence they directed the plan of campaign for the destruction of the monster that was winding itself along the ground: in short, we experienced scenes where the confusion or fright momentarily caused by some intruder or other filled our premises—subsequent to its removal—with the most immoderate laughter.

240. But it was more difficult to banish the distress that was soon to be visiting us, than the monotony. With the increase in the thunderstorms and the rising of the waters, the game continued to disappear from our neighbourhood, and the spoils of the huntsmen became more and more scarce and wretched, until it often happened that hardly within the space of three or four days would even a duck or aguti be brought home. The herds of cattle also disappeared along with the deer and ducks and the four Vaqueiros had to take things easy. Everything had retreated into the mountains. Our supplies of salted flesh had long been consumed, and meals became more frugal. At first, indeed, the officers helped us honourably with what they possessed in the way of meat, but their provisions also came to an end, and the remaining cassava bread spared by the insects together with the boiled soups made from it became our daily dish until at last one of the hunters was again sufficiently fortunate as to kill enough to satisfy eight hungry stomachs. A shot from the mortar sent the glad tidings of the event to the officers of the Fort, while from the flagstaff fluttered the signal "Invitation to Lunch," just as much longed for by them as by us when, in days of want, we in our turn hoped every minute to recognise the friendly sign.

241. As we were thus one morning about to eke out the roasted maize-cobs with a juicy piece of venison, one of our huntsmen who had left Pirara already before daybreak to try his luck, rushed back into our hut shouting "Matti, Matti, Caraiba, Caraiba, Soldato toukö." (Friend, friend, many Brazilian soldiers) and made us forget all about swallowing the morsel we even had in our mouth. We were already accustomed to the fright to which the term "Caraiba" every time gave rise in an Indian settlement, but the fatal "Soldato toukö-toukö" nevertheless put us into a more than indifferent state of mind—the "Soldato toukö-toukö" must be the Brazilian army which, as we knew from reliable information, had already left Para weeks ago, to drive the Red-coats, from Pirara. From the statements of the Indians, half dead with fright and fear, the "Soldato toukö" had broken up into two divisions, of which the one had taken passage by water in a large corial, while the other had turned off to the great oases south of Pirara. After our bearer of bad news had once again proved his information to be true, two shots from the small mortar thundered out towards the Fort, and the national ensign on the mast gave the garrison the fateful news. The reply was now run saucily up the flagpost at the Fort, and all the figures whom we had seen shortly before outside the ramparts, vanished behind them for a few minutes, soon to become visible again, as our telescope showed us, armed to the teeth. So far as we were concerned no defence was of course to be thought of, and resigning ourselves to the inevitable we did our level best by maintaining an outward indifference to inspire at least the inhabitants of Pirara with some courage: the news spreading among them like wild-fire seemed to have wiped it clean out. Armed with their bows and clubs, the men had immediately collected around us while with sucklings in arms and other children by the hand, the women thronged our houses. In this dilemma I casually asked the Indians who had brought the ill-fated news whether the soldiers carried guns, the

reply to which question at once allayed all fear, for it was in the negative. Soldiers without weapons could make no sudden attack and still less have a siege in view. The national ensign flying gaily in the morning wind was hauled down, and the signal "False Alarm" run up. Mr. Youd and Sororeng, who would have relieved us of our anxiety long ere this, were neither of them present, and we were not even yet able to accustom ourselves to the fact that with the Indians, everything exceeding the number of their digits, means "plenty."

242. While we were still making fun with one another over the homœopathic dose of our courage, and each one was maintaining that the confirmation of the report had been a matter of absolute indifference to him, there came into view upon the surface of the huge lake, now as smooth as a mirror, a large boat that was nearing Pirara, while almost at the same moment a small troop of Brazilians stepped out from the oasis. They were Captain Leal's subordinates, a portion of the garrison of Sao Joaquim, who, however, had come for anything but a warlike purpose. Captain Leal probably wanted just as good cash as Father José, for both had collected a large corial-load of provisions which they were offering us for sale. No one had dared hope a few minutes before that our confusion would have changed to joy like this. Curiosity over the cause of the false alarm naturally drew the assembled officers over to Pirara, where their accounts of the effects produced by our military signal redoubled the fun. The call to arms had even frightened them out of a game of whist and forced them to distribute weapons, munitions, etc., which the black garrison received with every indication of heroic courage. The largest of the turtle, of which Captain Leal had sent us a fairly good supply, as prepared by our present-time cook, Adams, of course obliterated the last trace of the excitement. We were still more delighted, however, when we learnt from the Brazilians that one of their countrymen was on his way with an even larger boat from the Rio Branco, and bringing us a load of turtle, salted and dried beef, and farine. It had already reached the landing of the Pirara the week before, but as the owner could not yet get his deeply-laden vessel up to the village, he had asked us through one of his people to pay him a visit. My brother and Lieutenant Weiburg immediately got on horseback and rode over to the place of sale, had a look at the goods, and soon returned with the trader from whom they purchased the whole cargo which consisted of 23 giant turtle (*Emys amazonica* Mart.) and a quantity of salted and sun-dried beef (Carne secca). My brother paid 2½ dollars for each of the turtle. The Carne secca both in appearance and taste bore very great resemblance to a dried piece of wood, which was of course only to be expected considering its method of preparation. The meat is cut into long thin strips, rubbed well in with salt, and then slung up on cords and so dried and impoverished in the sun until it becomes as hard as bone and completely black.

243. Stöckle and Tiedge and several Indians received orders to build a palisade in one of the inlets of the Pirara, where we could cage our turtle, and have them fetched one at a time for slaughter according to taste and requirements. Some of them were so heavy that they could hardly be carried by three men.

244. A week later a formal invitation was sent to the whole officers' corps: the first of the fat turtles was to be killed and this of course could not be done without our friends participating. The company arrived with smiling countenances and assured us they had gone without breakfast so as not to spoil their appetite for the soup and succulent turtle steak, whereupon Commissary Low prudently placed a few bottles of rum in a corner and some sugar in a box, so that a glass of punch might be drunk with the meat: up till now, the inhabitants of Nappi had supplied us with lemons for the very purpose. To forget our appetites, we sat down to a game of whist. Stöckle, Tiedge and four Indians had already been sent several hours before to the turtle pen only three-quarters of an hour distant, and Adams' cooking-pots had long been waiting for the flesh that they were about to render palatable, but all enquiries as to whether the messengers had yet returned were answered in the negative until finally, Stöckle himself walked into the house looking like a miserable sinner and, with his ghastly news, changed us and our hopes into veritable columns of salt. Stammering in a tremulous voice he gave us the awful tidings that, except for a single dead one, there was not a trace of turtle visible in the pen: by loosening some of the palings that had not been driven in too tightly, they had got away. The anxiety and embarrassment of Stöckle and Tiedge, who could well understand that they, the builders of the pen, would be regarded as responsible for the loss, bordered on the ridiculous, particularly as they tried to give vent to their feelings by cursing and swearing at the poor animals. Looking speechless at one another, we gazed upon the wreckage of our hopes and castles in the air, out of which the dried and blackened carne secca sneeringly stared, until the immoderate laughter of the officers, who through our loss had been defrauded of their present Luculline meal, awakened us out of our bewilderment, and forced us to join in with it. I shall never forget this both vexing, yet extremely ridiculous scene. Instead of turtle soup and steaks, the officers had to fill their hungry stomachs with sun-dried beef, which would have proved harder for us to chew than our friends' inexhaustible witticisims seasoned-with-salt, had it not been that we did not dare let them see that they were annoying us. We swallowed our vexation as best we could, and waited for the day of reckoning.

245. Depressed, we went next morning to have a look at the empty pen and satisfied ourselves, unfortunately too late, that the palisades for these huge animals had been too weak. The 57 dollars that they had cost us had been wasted, and short commons remained our caterer during the whole of the wet season. But a still harder loss was soon to be the lot of us all. A letter which two Indians brought from Bartika Grove contained instructions from the President of the Missionary Society in London for Mr. Youd to leave Pirara and return to Waraputa, because the Society did not dare extend its sphere of operations at Pirara until it had been definitely decided that the latter really belonged to British territory and soil. Like ourselves, he recognised that the orders had to be obeyed, and the abandonment of the field of his noble sacrifice to a growth of weed just at the time when he saw the scattered seed ripening with

the loveliest fruit, must have proved as heart-breaking for him as it did for us, because we had been many a time surprised in watching the progress that the people, already collected around him in such numbers, had made under his excellent leadership. The suggestion forwarded from London that the brave missionary might induce the inhabitants of Pirara and its neighbourhood to accompany him to Waraputa, could not be carried out unless he were to sacrifice the lives of those who had given him their absolute trust. Strange, however, as it may appear, experience had already shewn that the Indian of the savannah succumbs to the influences of the moist and musty atmosphere of the virgin forest, just as the occupant of the latter and of the mountains pines away and declines when he changes his native habitat with that of the free open and damp savannah. Here, like there, fatal pulmonary complaints result from such a transfer. When Mr. Youd was driven away by the Brazilians, several families followed him to Waraputa, where, after a short stay the majority succumbed to the change: the remainder had to be sent back into the savannah. After such experiences it would have been more than unscrupulous if he had wanted to invite his wards to accompany him. The re-established village with its pretty houses, and inhabitants eager to learn, saw its destruction looming ahead once more if it did not belong to England. The large house that Mr. Youd's restless activity had transformed into an uncommonly pleasant church where the inhabitants of Pirara were daily summoned at morn and eve by the shrill notes of a trumpet, for want of a bell, and where those of all the neighbouring settlements were gathered on Sundays for divine service, and which also served as an instruction-room for grown-ups and children, must soon become desolate again. Anyone who had been present at the drawling and screeching funereal and festive-songs of the Indians would believe that he was among quite a different set of people, if, during the Sunday congregations he were to hear the English hymns, in the singing of which the men, like the women, had made such progress. The voices of the women especially have infinitely more body than, judging by our experiences, we hardly expected to be the case: at the same time they possess a truly wonderful gift for picking up even the most difficult melodies. If such a tune be sung before them only two or three times, the women and girls sing it after without a mistake, while the men will play it on their simple flutes upon which they had previously only been able to strike the inharmonic and monotonous notes of their folk songs. The grown-ups, especially the women, took the trouble to learn reading and writing. As at Bartika Grove, so at Pirara, the Indians living in the neighbourhood, even those from Nappi, which lay over 20 miles distant, came every Sunday evening to the service which, in solemn silence, they attended with the keenest attention: serious sickness was the only thing that kept them away. On the Monday, they returned to their village. It had certainly cost Mr. Youd a great deal of trouble before he could make the wards committed to his charge forget their old habits. When he opened his church and school at Pirara, the children generally appeared painted from head to foot, as if they were going to a drinking-party: they chatted and laughed among themselves as often as they felt inclined, and ran away out and from it as soon as there was nothing new to attract them. With the adults, things were no better at divine service. Hustling noisily and disorderly along, they thronged into the church, their bodies also painted in the most awful fashion, armed with bows, arrows and clubs, as if for a war-dance or battle, while the women brought their tame monkeys or little children who, during the service, would fight most stubbornly for the mother's breast: a momentary suspension of hostilities was brought about among the contending parties when, according to her fancy, she put this or that one in possession of the disputed source of nourishment. My readers have already seen the change that had come over these people since then.

246. On Mr. Youd informing his faithful Macusis of the orders received, they were deeply upset, and very bitterly grieved, because they well knew that neither the military nor we would remain in Pirara for ever. They had all along attached themselves to him with absolute devotion, and now charged him with the most pathetic entreaties not to leave them again to the mercy of the Brazilians. His sacrificing love could not withstand such appeals: he soon made up his mind, and within a few days was off to Georgetown to hurry from there to London and personally press the prayers of the wards committed to his charge before the President of the Missionary Society. On his arrival at Georgetown, yellow fever had broken out afresh:—he quickly took passage in a vessel just leaving for Europe, but within three days succumbed to the wan Angel of Destruction who had followed him from coast to ship. The vessel happening to be near Barbados at the time, the body of the noblest and most thorough-going of missionaries whom I had until then got to know, was there laid to rest.

247. It almost seemed to be ordained that the Station in Pirara was never to reach maturity. The seeds of Christianity had twice already been scattered in the hearts of the Indians with the most surprising results, and twice had the harvest been destroyed before ripening. The complete destruction of the Mission was now imminent, because even if Pirara proved to be an English possession, it might be found difficult to find a missionary who would be able to lead a life attuned to the Indians' way of thinking and mode of dealing, with such devotion and sacrificing love as was shown by Mr. Youd.

248. Hardly had he left his beloved village than one family after another took its departure, and so more and more houses continued to be left and remained empty. The melodious and affecting singing of the church was silent and only here and there were the hymns, chanted by a few women or played by some men on their primitive flutes, wafted towards us at eve or morn from the houses that were occupied. Heart felt love for their teacher had led the inhabitants here from near and far: the yearning for their old homes was re-awakened with his loss. Pirara would soon alone be sheltering us, our people, and the Indians who wanted to accompany us to Roraima. It was only towards the end of the wet season that the village became now and again first enlivened for a few days, when the old inhabitants, arriving in long processions, would bring us provisions for exchange.

249. The general inundation, and the almost daily steady downpour of rain had now soaked the sultry oppressive atmosphere with so much moisture that the clothes not in use went mouldy in the boxes, and to prevent them being completely spoilt, we had to dry them before the fire every day. Iron tools that had only lain on the ground a short while were so destroyed by rust as to render them unfit for use, silver oxidised, my arsenical soap became completely decomposed, and all the hopes that I had set on my numerous collections seemed to vanish in the damage that was daily making further progress. The grief that must afflict anybody who, when giving an airing to the boxes on which he has built his future, taken so much trouble with, and planted so many hopes, recognises their impending ruin, can only be felt and appreciated by one who has had similar experiences. And yet in the earnest determination to persevere invariably in mastering the hostile forces of Nature, there lay a general sense of satisfaction, as each successful attempt at hectoring these evils out of but one single plant, produced a feeling of pride and confidence that at least prevented one becoming absolutely disheartened.

250. Like ourselves, the Pirara villagers were almost restricted to a vegetable diet, because their supplies of flesh and fish were only too quickly consumed, and even the former would soon be more than scarce: the new provision fields established since Mr. Youd's arrival and the old ones that had been cleaned up, were as yet yielding no produce except unripe maize. The half-ripe cobs were roasted on the ashes, or boiled, and by whichever method prepared supplied quite a palatable dish. The oily fruits of the *Maximiliana, Mauritia* and the *Astrocaryum* were about the only nourishment of the Indians, who yet completely retained their bodily strength, to which the ripe nitrogenous contents of these palm-fruits probably contributed a very great deal. When the provisions brought in were finished up they usually betook themselves in regular parties to the more distant forests, whence they returned after a few days' time, with large quantities of the above or with the fruits of a *Eugenia, Psidium, Spondias, Mimusops* or other tasty plant which we were unable to identify owing to the lack of leaves and blossoms.

251. Soon after Mr. Youd's departure we were once more upset and worried by an accident that befell one of our hunters, a strong young fellow. As we never let any tolerably fair day pass without going out to hunt, this man had got up at daybreak, though the weather was not exactly too propitious, to see if he could not find a deer perhaps on one of the hills that the water had not reached. The sun was already nearing the horizon and Essetamaipu had not yet returned, a fact that did not strike us as strange until we saw one of the other Indians hurrying over the rise up to the village at a very quick pace, the surest harbinger of some important or evil news: for otherwise, the Indian takes his own time when making his way to camp. We were right in our conjectures. He had found Essetamaipu, bitten by a snake, lying senseless in the savannah some miles distant from Pirara. Providing ourselves with all possible means of help, we hurried to where the unfortunate fellow was said to be, and found him lying there unconscious. A wound over the

ankle of the right foot scarified with a knife in a truly ghastly fashion and bound round with a strip of loin-cloth showed the spot where the poor chap had been bitten. The whole leg was swollen while the most violent cramps convulsed the body of the unconscious man, whom one could hardly recognise again owing to the facial expression becoming so distorted with the fits. As poor Essetamaipu was crossing the savannah, he had trodden on a rattle-snake which he had straightway killed with his direct and instinctive feeling of revenge: with the insensibility to pain so characteristic of the Indian he had only then cut out and bound up the wound. As the accident had taken place on the high-lying savannah, it was only with difficulty that he had crawled close to the path, where he had hoped he would be found all the quicker, and here he had sunk unconscious.

252. As soon as the villagers had seen us hurrying off, and had probably also learnt the reason, about half Pirara had followed us: squatting around, these gazed in silence upon the unfortunate fellow while his wife and children gave way to a heart-rending lament. Judging from the coagulated blood, the accident must have taken place several hours before: suction or cauterisation was therefore no more applicable, and we accordingly just washed out the wound with spirits of ammonia, and made him swallow, while still senseless, the same stuff diluted. These measures did not apparently fail in their effects. Consciousness returned and complaining of pains in his breast and region of the shoulder as well as of a dragging in the limbs, and back-ache, he was carried in his hammock to Pirara. The leg as far as the hip remained swollen out of shape and was completely paralysed for several days: at the same time he experienced the most excruciating pains on the slightest movement. In three weeks time, with a warm emollient poultice of cassava bread the swelling had not only subsided but the corpse-like expression and the pains had disappeared: within five weeks the wound had closed and the invalid could once more use his foot.

253. Though the mortal effects of snake-bite can be prevented by measures speedily applied, the individual bitten nevertheless bears traces of the after-effects throughout the whole of his life, and often succumbs to them several years later. The wound generally breaks open again every year, and the bitten limb continues to remain the most painful weather-prophet. Several of the Pirara villagers were living witnesses of this, and an earlier companion of my brother's on his first journey, Mr. Vieth, who in the year 1834 had been bitten on the foot by a Labaria (*Trigonocephalus atrox*) was still suffering from the effects of the bite upon our arrival in the Colony some seven years later. He experienced the greatest agony on the slightest change of weather, and the wound every time broke out afresh with a very evil-smelling continually-moist discharge.

254. In addition to the measures generally applied for snake-bite, *i.e.*, excision and suction of the wound as well as fresh sugar-cane juice, when locally obtainable—the use of which the Indians say is a certain cure for poison-arrow wounds—almost every tribe possesses its own par-

ticular remedy, among which, of course, a large number must be reckoned imaginary. Thus in some tribes, neither the wounded man nor his children, nor his parents nor his brothers and sisters, so long as they live in one and the same village with him, are allowed to drink water, to bathe in it, or to come near it, during the period directly following on the bite: his wife is only permitted to do this A thin pap of pumpkin, that may only be eaten warm, has to quench his thirst. Roasted plantains are the only nourishment allowed him at this time. If the person bitten has tasted sugar-cane juice after the accident, he must later on avoid all sweets. Other tribes believe in human milk as an efficacious antidote which they employ in conjunction with emollient cassava bread poultices, but according to our own experience, the only counteracting properties are to be ascribed to the latter. Others again apply the expressed juice of the leaf stalk and roots of the *Dracontium dubium* Kunth., *nov. sp.,* as I have already taken the opportunity of mentioning. The customary use throughout almost the whole of South America, particularly in Peru and Chile, of the *Mikania guaco* Humb. Bonp., which the aborigines call Errawareng, was quite unknown among the Indians of Guiana, although in addition to this species I found here the *Mikania racemulosa* Benth., *M. Hookeriana* DeC., *M. denticulata* Willd., *M. convolvulacea* DeC., *M. Parkeriana* DeC., and *M. angularis,* which almost always possess the bitter principle. The mulattoes employ a decoction of *Mikania Guaco* and *M. angularis* as a powerful remedy against syphilis. Of fairly general use for the bite of a rattle snake, is the infusion of *Byrsonima crassifolia* and *B. Moureila* Loudon, of the Aroids already mentioned, as well as that of the *Quebitea guianensis* Aubl., belonging to the same family. The healing effect of all these remedies appears to depend however to a very great extent upon the bodily constitution of the person bitten, because it is only very rarely that women and weak men escape with their lives.

255. The snakes that the Indians and Mulattoes are mostly afraid of are: the Labaria of the Colonists, Sororaima of the Macusis (*Trigonocephalus atrox*) of which there are a few varieties particularly differing from one another through some deviation of colour, and the universally shunned Bushmaster, Kunekuschi of the Indians (*Crotalus mutus,* Linn., *Lachesis muta* Daud., *Lachesis rhombeata* Pr. Neuwied) the length of which is said to vary between 4 and 8 feet, and the girth to approximate that of a man's thigh. Like the poison-fangs which are often over an inch long, the heart-shaped head, considerably widened by the poison-glands, and surprisingly well deliminated neck, are indications, even at a distance, of the dangerous nature of this beautifully marked reptile. Indeed, if it did not live in the high forests, where, during the day it lies coiled up on the ground, and were it to be more plentiful than it really is, Death would be lying in wait for the wanderer at every step, because judging from what the Indians all say this snake does not run away from man like the others, but wound up in a spiral quietly awaits the person approaching, and then darts at him with the quickness of an arrow. During my first stay at Bartika Grove I met a mulatto there whose son, some weeks before my arrival, had been bitten in the left cheek by the malicious

Bushmaster. The son was found unconscious by the father who sucked out the wound. Within a quarter of an hour the latter experienced indescribable pain, his head swelled to a shapeless size, and he showed all the symptoms of poisoning which, as it happened, had found entrance through a hollow tooth, into which the sucked-out poison must have been introduced. The boy died and the father was still dragging along his sickly existence during my last visit there.

256. Dread of the two snakes above mentioned exceeds by far that of the Maracca, as several tribes call the Rattle-snake (*Crotalus horridus* Daud.) on account of its rattle, because its bite proves fatal in only a few cases. I had often got within 6 or 7 feet of the latter and quietly observed it: true, it kept its eyes on me all the time, but did not show the slightest inclination to make the danger-threatening spring,—yet the slightest incitement, a sudden approach, immediately sets the animal in a rage. Winding itself into a spiral, raising its head and neck into the air with widely-open jaws, and giving a very characteristic hiss, it looks angrily around, only rarely misses its mark and pierces even the thickest clothing, the strongest boots, with its poison fangs. The accompanying shaking of the tail produces a noise to be sure, but not loud enough to be heard far. This peculiar movement, however, is not, as one has hitherto believed, entirely confined to rattlesnakes, where it is recognised as a warning before biting, for I have observed the same thing many times among non-poisonous snakes, especially in the beautifully marked *Coluber variabilis* Kuhl. on getting near it. The triple warning of the rattlesnake may be classed in the same category of fable as the powers of fascination that have been ascribed to it. When the poison teeth are broken by biting on a hard object, they are soon replaced by new ones.

257. In the same way, the Parrot-snake (*Cophias bilineatus*, Pr. Neuwied), so named from its bluish bright-green colour, is reckoned one of the most poisonous snakes, and is generally feared. Its large poison-fangs explain this superstition. I have still to mention another snake of which everybody is equally afraid, that never came under my direct notice, it is true, though one hears plenty said about it and which my brother killed on his previous journey. It is the Iguana snake and is named after the pouch which like the iguana it carries under the throat. Its ground-colour is said to be yellow and broken by diamond-shaped black spots. It reaches a length of from 5 to 7 feet. One must also note the shaking of its tail previous to the spring. The Indians regard it as one of those snakes that are most to be dreaded.

258. The effects of snake-bite had made me fairly timid at first. During the course of my botanical excursions whenever I heard something rustling in the grass or felt myself held up by a vine-rope, I thought I saw a snake ready to spring, though in the course of time I managed to gain confidence. On my first expedition to the Orinoco it was particularly the lizards that made me take many a jump until I learnt to distinguish the noise they caused from that produced by snakes. The former run much quicker and always only for a short stretch, when they will stop for a second, and then continue on their way, while the snake sets out more slowly, more regularly, and not by fits and starts: it is only the fatal

spring that gives an indication of its wonderful muscular powers. It is with horror that I still always remember the circumstance when I first came into actual contact with a snake. During one of my hunting expeditions, while staying with Mr. Bach, I saw a 6 to 7 foot long snake winding its course slowly towards me: it was too far, however, to allow of my seeing whether it was a poisonous one or not. Both barrels of my gun being loaded, I quietly take aim, shoot away, and the creature circles round in convulsions. A fluttering in the branches of the tree under which I am standing attracts my attention, and two beautiful parrots, new to me, that were perched in its shadows and had been frightened by the shot, are just settling down again upon the outermost portion of a twig. The snake appears to be mortally wounded, and with the still loaded barrel I bring down one of the birds. I now see the snake slowly winding its way to a thick bush, where it disappears while I am recharging. With the loaded weapon in my hand I make another search for it, but in vain, and I have to get closer, when suddenly, swift as an arrow, the wounded reptile that had watched my approach and prepared to spring, darts against my shoulder and makes me take a big jump backwards. Struck all of a heap with terror, without knowing whether I am wounded, I see the animal again preparing to spring when a lucky shot however prevents it. On closer inspection I discovered just as much damage to myself as poison in my furious enemy: it was only the harmless black *Herpetodryas carinatus* Schleg. I have never found any poisonous snakes upon trees or bushes, a fact that seems to confirm Prince von Neuwied's observation that such creatures do not usually climb them. They like dark lurking-holes just as much as they do the hottest rays of the sun and almost glowing sand. The ratio of poisonous to non-poisonous snakes might be represented in Guiana as 1 to 8. The powers of fascination which the rattlesnake is especially said to exercise over birds and smaller mammals is an old-time myth: on the other hand, the wild scream and flutter with which a bird seems to try to drive off not only this but every other mischievous enemy in general has more than once betrayed its proximity to me. Prince von Neuwied rightly puts it that this myth must have its origin in the state of terror into which perhaps an animal could fall when suddenly confronted with a poisonous snake and then seized by it: he also noted carefully the giddiness of the frightened creature after receiving a bite, upon which several generally follow one on top of the other.

259. According to experiments carried out by reliable people in Georgetown, a poisonous snake biting another poisonous snake only causes a short lethargy, which soon however passes off. The Africans seem to have brought over with them from their native land the art of taming poisonous snakes, because it is nothing rare for them to understand it so thoroughly that even rattlesnakes, without having their fangs extracted, will coil quietly around their masters' arms without danger, and live with them on the friendliest of terms.

260. Some days after Essetamaipu had met with his accident, we learnt by experience that when the victim does not exceed the size of the reptile's jaws it can be carried about alive in the belly of a big snake for

some time. For a short while past a 6 to 8-ft. long snake had claimed our attention, but owing to its quickly withdrawing into the thick bush upon the slightest noise, it had put our patience to the test, when it was finally outwitted by one of the Indians, who with a triumphant laugh, brought it to me. From its somewhat swollen belly we presumed that it must have swallowed an animal recently, and when I cut it open I found two large toads covered over with a yellowish slimy envelope. Regarding them as dead, I threw them aside without worrying over them further, until after a few minutes I noticed to my surprise that they were beginning to move and gradually showing more distinctive signs of animation: in the course of eight minutes they had so far recovered as to decamp. Judging from the speedy and strong digestive powers of snakes the two toads could not indeed have been long in their narrow prison although an interval of at least 6 to 8 minutes, probably not more, must have elapsed between the swallowing of the victims and the death of their captor. The harmless snakes *Coronella cobella* Linn., *C. Reginae* Linn., and *C. Merremii* Pr. Neuwied are very frequently met with in the savannah.

261. After this somewhat lengthy digression about snakes, let me return to our life in Pirara, which, however, I do not propose recording until from the middle of August, because each day was but the mournful monotonous repetition of the one gone before, while except for the island-like oases, one saw ahead only a muffled grey sky, and an almost limitless sheet of water which stretched in the North as far as the base of the Pacaraima Ranges, and in the N.E. and N.W. out into the far distance where its edge became blurred with the horizon. Only during the second half of the month did the atmosphere begin to change, the sky become clearer, the thunderstorms rarer, and often four to five days pass without any rain falling: the wind, however, still blew from out of the West and North-West, and drove away the morning haze that now appeared fairly regularly.

262. The meteorological observations carried on from the end of May until the end of August, gave the following results:—

	BAROMETER IN ENGLISH INCHES AND DECIMALS.				THERMOMETER—FAHRENHEIT.			
	Highest.	Lowest.	Mean.	Maximum difference.	Highest.	Lowest.	Mean.	Maximum difference.
End of May ...	29.500	29.292	29.334	0.208	91	73.5	81	17.5
June ...	29.496	29.310	29.439	0.186	90	73.5	81.07	16.5
July ...	29.722	29.500	29.621	0.222	86.5	74.8	80.69	11.7
August ...	29.730	29.500	29.617	0.230	88	76.	82.16	12

263. Thanks to our Indians and spies, all kinds of doubtful reports continued reaching us concerning our neighbours the Brazilians, and were war operations really to commence, the particular time had now arrived when they could be most easily undertaken because the flooded

streams formed most convenient highways. We had to await our lot calmly because, however much we had longed to see our boat return from Georgetown not only with provisions but also with instructions for the garrison of Fort New Guinea, our wishes up to now had remained unfulfilled. During this period of uneasiness and uncertainty when every sunrise wakened Hope anew, there arrived a party of Indians who wanted to barter us several of their drums (Sampura) painted with hieroglyphics. The drum itself consisted of a 1½ foot deep horizontal section of *Mauritia flexuosa* trunk that allows of its pith being easily removed as soon as it has been lying in water for some days*: the cylinder is then covered over with monkey or deer skin which is stretched over it just like that of our own drums. As Columbus already came across drums among the natives, it appears to be one of those instruments of which each nation is its own discoverer.

264. The sting of the chaff with which our friends from the Fort had almost daily overwhelmed us ever since that unfortunate turtle dinner, had been just as little blunted in the course of time as was our firm determination to be revenged. No opportunity had hitherto offered by which, through any manner of means, we could get satisfaction, but now one presented itself. The rumours of war, so many times renewed had naturally increased the heroism of the sons of Albion, and, whenever we met, conversation turned mostly on the gathering of the laurels with which each one already imagined seeing himself crowned.

265. Hardly had Tiedge spotted the drums than he seized one—an instrument of which he was exceedingly fond, for he had completed his military service as drummer—and beat a most artistic tattoo, in which he was exquisitely accompanied by Stöckle who had also been passionately devoted to this form of music in his native country. On the supposition that the officers would not suspect that Indians possessed drums just as well as Europeans, for these things were not indigenous to Pirara, and that they were ignorant of the skill displayed by the two Swabians, our plan of revenge was immediately set on foot. Chance had it that our hunters brought in a deer on the following morning, and the signal "Invitation to supper and a game of whist" fluttered gaily from the flag mast. Chaffing and joking over the delightful message, along came our friends, whom the excellent roast, prepared by Adams, only served to make even more chirpy. The latter is removed, the ingredients, brought by the officers, ready mixed for punch, are steaming in a big dish upon our table, and the glasses are already filled, when there falls upon the revelry a sound that as quick as thought slings the steaming glass from the lips, changes the laughing countenance into one of the deepest concern, and strains the listening ear to the utmost. Hush, isn't that drums beating? Yes. The notes, single up to now, next join to form a gradual increasingly distinct war-march—everybody listens breathlessly. With arms raised the gentlemen stand round the table, while the duties they had neglected, as in a nightmare, rob them

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* The Warraus who probably know more about the working of this timber than any other Indians, assure me that this must be a mistake: that the composition of the trunk would never allow of its being treated in this manner to form a drum.

of speech. "The Fort is taken! The Brazilians! The Brazilians!" were, after some minutes silence, the first words to fall from Lieutenant Bingham's oppressed chest, while the alarmed officers rushed outside to expiate in blood the disgrace that they imagined had already befallen them. We had got our revenge, and shouting "Don't you know the Turtles' Dead March?" we hurried after them with roars of laughter, while they, unable to check their speed, only came to a halt when the two drummers, who were just then turning the corner of a house, ceased playing. Puzzled, the gentlemen now stopped, and our immoderate laughter forced upon them the conviction that they had been fooled. We returned in triumph, and overjoyed at the success of our revenge, back to our abandoned glasses, while the officers, though piqued, soon joined in the merriment, for they well recognised that, if they let us do all the laughing, they would appear to still greater disadvantage. Lieutenant Bingham was certainly of opinion that our action had been beyond a joke, for he would like no one to suffer the same agony of mind as he did on hearing the first distinct beating of the drum, when the lamentable consciousness forced itself upon him that in leaving the Fort, all his officers had neglected a duty which he now had to atone for. Nevertheless this very evening remained one of the most cheerful that we had spent throughout the rainy season.

266. Some days later, several people from Haiowa brought us the longed-for news that our boats had arrived there, and that we could expect them 3 to 4 days later in Pirara. But as our own and the officers' impatience and desire for news could not be curbed for so long, some of the Indians were soon packed off to the Rupununi to take passage from there in a light corial and meet the heavily laden and slow boats, when they were to be given the despatches and letters, and to return with them as quickly as possible: a cannon-shot was to notify the garrison of the Fort when they returned. On the following night at 1 o'clock this boomed out in the stilly darkness and brought the officers over to us, but amongst all the many letters and scrips there was not a single one addressed to them. Lieutenant Bingham had been looking forward for fresh instructions just as anxiously as my brother, who received advices to continue the boundary expedition as quickly as possible. To the great astonishment of us all the military commander appeared to have been forgotten, until one of the mulattoes who had accompanied our messenger to Pirara, solved the puzzle by informing us that a police-boat had accompanied ours, and was conveying separate despatches for the garrison of New Guinea, the contents of which were unknown even to those who brought them. The police boat had only left Georgetown a week after their departure and had reached the other side of the Falls. The advices must be important, and the previous surprise over their non-receipt now made way for a great number of conjectures as to what they contained. Two days later in strode the messenger: the detachment was recalled. The joy which this order caused among the officers and men almost sent them mad, and it was a long time before the former could tell us quietly and rationally all about the instructions they had received. The despatch that had been sent to Pirara through Police Inspector

Creighton immediately after our arrival in Georgetown in the year 1841, and which demanded immediate evacuation of the village by the Brazilians was next sent on by Captain Leal to the President of Para, and from there had only first reached Rio Janiero. In January, 1842, an agreement had already been concluded between the British Ambassador on the one side, and the Brazilian Minister of Foreign Affairs on the other, according to which Pirara, so long as the boundary disputes were not definitely settled, was to be regarded as neutral soil and territory which neither Brazil nor England might occupy with soldiery. In the meantime it was permissible for the former as well as for the latter to send missionaries there. But before this treaty could receive the force of law, it had first of all to be forwarded to London for ratification, and this happened to be at the very time when, acting upon previous instructions, the military had set out on the Essequibo for War operations. It had been ratified in London in June: at the end of July its notification was received in Demerara whence the Governor had despatched the order for the recall of the military some days after the departure of our boats containing the provisions and trade. The President of Para, whom the treaty had also only reached at the end of July, had of course up till then made all arrangements for driving the British out of Pirara immediately after the entrance of the dry season. Besides the assembled military of the Rio Negro there were yet two regiments of the line on the march out from Para, who had already reached the Rio Branco, when they received the orders to return.

267. The peaceful conclusion was all the more welcome to our officers because they foresaw too well that with the scanty forces at their command anything but laurels could be gained, and so the despatches arrived just in the nick of time before the attack on the part of the Brazilians, who were quite eight times the stronger, was to be attempted. From the accounts that I subsequently received from very reliable sources, the execution of this certainly ill-conceived project had cost the Government not less than 24,000 dollars: with this sum they could have carried out their intended purpose far more securely, even more cheaply in fact, if they had simply blocked the mouth of the Amazon. It was a case of having to say good-bye to our friends and also to the Fort which, according to the instructions just received, had to be razed to the ground.

268. It is hardly necessary for me to describe the sensation this news caused not only us, but also the dwindling population of Pirara. On the one hand, thoughtless joy and rejoicing, on the other keen disappointment: in short, people in the most contrasted moods crossed one another in the motley crowd. The boats which were to bring the troops and war material back to Georgetown had followed close upon the one with the despatches and accordingly might be expected at any time. As the officers regarded every hour spent here subsequent to the arrival of the transports as a loss from the social delights of Georgetown, they began making a start the very next day with the packing of the military stores, etc.

269. What with the high level the water had already reached, the Awaricuru was now only separated from Lake Amucu by a small ridge, for which reason both our provision boats could be landed here, emptied, and then dragged over it, and so bring by lake the longed-for goods and chattels up to the immediate neighbourhood of the village, thus making the tiresome land-transport unnecessary.

270. Unfortunately, both the provisions as well as "trade" had been considerably spoilt by the incessant rain to which they had been exposed during the journey, and when we opened the boxes that contained our small supply of wine, rum, etc., we recognised signs of damage inside as well, for out of every dozen bottles, six on an average were broken. Naturally, we could only ascribe this loss to neglect in packing, until here again Repentance or Revenge, on account of an insufficient share of the stolen spoils, supplied us with the explanation. Coxswain Hendrick, like our countryman Reuter, whose business it was to superintend the paddlers, knowing which cases contained the spirits, could not resist the temptation, and in conjunction with the boats' crews drove nails through the seams of the boxes in such a way as to break some bottles in every one of them, when the escaping liquor was collected in calabashes and divided. Had the boats' crews committed this refined theft amongst themselves, we should not have been so upset as we were on learning that Hendrick and Reuter had been the ringleaders. Unfortunately, we could not do without Hendrick, though Reuter's days among us were now numbered,—the military boats returning took him back to Georgetown which he certainly never lived to see on account of his contracting at Bartika the same disease which we had recognised in the young Dutch girl on the Essequibo (I. 649): he was buried there three days after arrival.

271. As Lieutenant Bingham had at the same time received despatches for the President of Para informing him of the marching orders of the English military, Lieutenant Weiburg was sent with them next day to Fort Sao Joaquim, to hand them over to Captain Leal and have them forwarded on. One of the three boats we had used on the Takutu trip, which according to the statement of some Indians who had visited Pirara mouth a few days before, ought still to be there, offered him the most convenient means for the journey: our countryman Tiedge accompanied him to fetch the baskets of mandiocca or farinha, which with the Brazilians takes the place of cassava bread, promised us by Commandant Leal. It is obtained from the starch of the cassava roots, and by means of special handling formed into grains of the size of our groats. When meal-time comes round the Brazilians are so adept at throwing these crumbs into their mouths with the finger-tips, that only rarely does one miss its mark.

272. Mr. Weiburg returned six days after his departure and specially interested me with a report which Tiedge confirmed. While travelling up the Takutu they were at first regularly frightened by several shapeless animals whose heads appeared from time to time above the surface of the water, owing to the creatures being entirely unknown to them: their existence, however, was subsequently substantiated when they recognised

two of these huge beasts that had been harpooned at a Fazenda situate near the Zuruma mouth. From the description supplied, they were Sea-Cows (*Manatus americanus* Cuv.) As we were taking the same route in a fortnight's time and the Berlin Museum possessed none of these interesting animals, the information was naturally all the more welcome.

273. Two days after Mr. Weiburg's departure for Sao Joaquim the big military boats arrived and everybody strove to freight them as quickly as possible with the goods already packed. I also took the opportunity of again sending a portion of my collections under the supervision of our friends to Mr. Bach, so that he might forward them on to Berlin.

274. A few days before the return of the transports, the young Indian girl Baru—who, as the reader will remember, accompanied us with her future husband the Macusi Aiyukante, on our trip to the Takutu, and had already shown an almost unconquerable antipathy to him,—rushed into our house with the most patent signs of fear and excitement, and weeping bitterly, beseeched us to free her from the persecutions of her hated bridegroom and allow her to travel with our boats to Waraputa where she wanted to put herself under Mr. Youd's protection. She could not become the wife of the hateful fellow and, when she told him of her fixed determination, he had threatened, in case of refusal, to put her to death, a fate she would not escape as soon as the soldiers were withdrawn and we had left for Roraima. Baru was undoubtedly the prettiest Macusi girl in Pirara: the attentions that had been paid her not only by the officers, but also by ourselves, and the evident favour in which she regarded one of the members of our expedition had so played upon Aiyukante's jealousy, now increased to deliberate vengeance through her indifference and antipathy, that he forgot all about ordinary precautions and had told others what he proposed doing. My brother was in a dilemma, for according to Indian concepts, Baru was Aiyukante's property because he had already bought her as a girl, to take her for his second wife after she reached maturity, and everything was to be feared from his revenge. This fact decided him, as far as it lay in his power, to prevent such a disastrous result. Still crying and with voice trembling, Baru assured us that she had so far informed no one of her intended escape to Waraputa, and with the greatest tension the poor girl was now depending upon my brother who, to her inexpressible joy, after thinking the matter over a while, allowed her to go. To defy Aiyukante openly, would be but to hasten his vengeance—it could only be prevented by craft. Aiyukante must be kept away from Pirara until such time as Baru had got off on our boats. He had already for a long time past regarded Sororeng with envious eyes because the latter had not only been hired to accompany us to the Takutu and the more distant settlements, but had now again been given the job of engaging men for us. More men, however, were still wanted and accordingly on the following morning my brother asked Aiyukante whether he could procure some. He promised to do so gladly, and by afternoon had left the village to get his promised pay as soon as possible. On his return Baru had already left Pirara two days before. Lashed with all the fury of unbridled passion, more like a raging

beast than a man, he rushed into our house to demand his run-away bride, but only to learn our cool and fixed determination that if he dared follow her we would have him either strung up or shot down. Our calm demeanour and at the same time unexpected threat which he did not for a moment doubt would be carried out, because we had hitherto always kept our word, made him instantly bury his wrath and also promise that he would give up the girl. Gloomily he left our house, only returning to the village to offer his services on the day prior to our departure for Roraima.

275. The evening before the officers were to leave saw us once more together at a jolly supper table where, joking and laughing, we remained until morning, never dreaming when we said good-bye that it would be the last occasion we should shake Dr. Bolby's hand: shortly after his safe arrival in Demerara he was transferred to St. Lucia and fell a victim to yellow fever. On getting back to Georgetown we also learnt of the death of Lieutenant Bush who, on his return from Pirara to Georgetown in March had taken ship to Europe and died on board. Thus in the short course of nine months four of the Europeans who had foregathered in Pirara so late as March had gone to their last rest.

276. Daybreak saw the Fort in brilliant flame, the early morning sun lighted up like magic the thick columns of smoke winding up in spirals, and within the course of an hour we were confronted with a black space where the conflagration had taken place and from which a few isolated smoke clouds were still rising. The military joyfully withdrew, while the few inhabitants gazed in deep sorrow at the spectacle and at the soldiers gradually fading away in the distance, for they recognised only too well that with them there disappeared the security hitherto enjoyed, but which Pirara could no longer offer them. The three Vaqueiro deserters had joined the military from the same conviction: Reuter had to follow, forced by necessity. For the first few days our houses lost their cheeriness and it was only the strained activities entailed in preparing for our journey that lightened to a certain extent the depression consequent on the departure of our friends.

277. The tropical winter had ceased raging, the bright cloudless sky glittered down anew upon us night and day, while the steady East North East wind ruffled the extensive water flats into little ripples and blew away the mists so dangerous to one's health: the latter are generated after the rainy season from out of the masses of water collected and, particularly on the coast, give rise to deadly fever. Wherever the eye turned, it met a newly-awakened healthy growth of vegetation—the whole of Nature had become one vast hot-house. According to the observations recorded with the Pluviometer the rainfall from the end of May to the end of August amounted to 72 inches. On the Coast where, to be sure, two rainy seasons prevail, this fluctuates during these periods beween 80 and 100 inches.

278. Before taking our departure for Roraima, an interesting discovery led me once more to the Canuku Ranges, with whose inhabitants our communications had been interrupted for a long time past owing to the completely overflooded savannahs. A party came from Nappi to-day

bringing, besides provisions, several bird-skins, amongst which I was astonished to find that of the *Coracina militaris,* a bird so exquisitely beautiful on account of its purple feathers. According to the statement of the Indians, the Warara-tarika only appears during the rainy season in the Canuku Ranges, although even then not every year, my brother never having seen a specimen on his previous five-year trip. In spite of the difficulties of the road with which the Indians impressed me, and of the short time still available, I had made up my mind to accompany them to Nappi on the following morning directly I recognised the seductive but unfortunately badly-removed skin: I had ventured to hope that I would learn much about the bird there, and if possible, still kill a few specimens, a contingency which was disputed. All hands at Pirara were in such demand that not even Stöckle could accompany me.

279. After wading at the very commencement for four long hours through water, that in several places reached up to our arm-pits, for which reason I had prudently taken up my position in the middle of the procession, while the Indians walking ahead knew how to avoid every untoward depth with a discernment that to me was incomprehensible, we reached Awarra where we camped the night. On the following morning my guides took a deviation from the previous path, as compared with which our yesterday's water-trip was but a curtain-raiser. After taking over two hours to cross the open savannah we came upon the equally submerged forest into which we now bravely plunged. The small forest stream Quayé, the bed of which I traversed with dry feet on my first visit to the Canuku Range, had changed into a boisterous current. A felled tree-trunk at least 3 feet above which the water now flowed, formed the only means of getting across. But how to do so? Every assurance of the Indians that the trunk was lying here, did not help my dim-sighted eyes at all, because except for a small alteration in the colour and movement of the water, I could see nothing, however much I wanted to, and the slightest slip would send me down to the bottom. Finally two Indians took me in between them, and I was dragged, rather than went, across. Unfamiliar hitherto with this kind of water-excursion, the journey proved uncommonly tiresome and was still further aggravated by wounds caused by the wanton fronds of the pimpler palms which lay about on the ground beneath and could not be seen owing to the depth of water. Finally I lost sight of my guides between the trees, the muddied water for a long while remaining the only indication: worried by this I tried to come along more quickly, but in doing so started slipping every minute on one of the innumerable smooth roots, and in attempting to keep upright regularly loaded my hands with the prickly spines off the palm trunks or thorny brushwood. It was a terrible journey. After the Nappi River, with its banks submerged to a depth of 3 to 4 ft., had opposed similar difficulties to me as the Quayé, I finally arrived with my companions at Nappi village. Good old Pureka, one of my guides, lighted a fire under my hammock as if I were going to be eaten in the evening, while his young wife boiled a soup of *Phytolacca decandra* and Manihot sprout-tips: but all these precautionary

measures proved unavailing, for during the night my veteran friend, the fever, attacked me worse than almost ever before.

280. As I found it impossible to leave my hammock in the morning, I had to have the hunters sent for, to obtain the information required concerning the business that had brought me here. The first thing I learnt was that the birds had already taken their departure since the end of July, for it is only during June and July that they are to be seen on the Ranges: but it was possible that a few stragglers might still be discovered.

281. Next morning everybody hurried into the forest to earn a knife, the price I had set on the bird. Unsuccessful as regards the main object, they returned in the evening with a number of other birds amongst which were two specimens of *Rupicola* which, during the months mentioned, so I was informed, came down just as frequently from their rocky pinnacles for the ripened berries. They had even shot 24 specimens of *Rhamphastos vitellinus.* These were as partial to the same food as the *Rupicola, Coracina*, and other *Ampelidae.* Unfortunately I could not systematically identify the tree bearing the berries that attracted the most beautiful of the feathered fellow-denizens of the forest.

282. As the fever would not abate, and while afflicted with it I could not start on the return journey, I determined upon sending two Indians to Pirara to fetch the quinine lacking. For want of ink I used the red pigment of the *Bignonia Chica* and wrote my requirements on a piece of paper that one of the Indians, having found in Pirara, had guarded like a relic. The messengers left at about four o'clock in the afternoon and on the following morning at 9 there they stood by my hammock with the longed-for medicine. In spite of the unspeakable difficulties of the road, they had traversed the 45 or more miles in seventeen hours. Twenty grains of quinine freed me from the mischief-maker.

283. The Piai had already on the day of my arrival offered me his services, but not feeling quite inclined to listen to his nonsense, I had refused it. When, however, I had swallowed my own surer remedy, and content in the knowledge that I should be freed from the fever, felt brighter again, I was more than glad to accept his repeated proposals with a view to becoming more thoroughly acquainted with the ceremonies of exorcism. Hardly had night set in than the old man entered the house with two bundles of leaves in his hands, and straightway drove the other occupants out. He next extinguished all the fires, squatted close to my hammock, whipped the ground with the leaves, and raised a howl that pierced my very marrow-bones, and of which I could but make out the words "Heia, Heia": only now and again did a short pause interrupt the howling. After proceeding like this for a quarter of an hour, I suddenly recognised at the side of my hammock a second voice with which the Piai entered into a regular colloquy, he putting questions and receiving answers. Despite all efforts I could not owing to the darkness, make out whether the voice arose from a confederate who had sneaked in unnoticed, or whether the Piai was a ventriloquist: I incline to the latter view because, on the following morning, I could only

discover in the floor dust the Piai's tracks, but no second person's. The conversations with the Evil Spirits are unintelligible even to the Indians: it is only on the next day that the medicine-man undertakes to tell them what they are. When they had had their talk, the sorcerer placed himself at the head end of my hammock and continued blowing on my forehead: after lighting a cigar he puffed thick clouds of smoke into my face enough to suffocate me, and pressed on to my brow the bundle of leaves, that I recognised by the smell, to be tobacco. This continued for quite half an hour and produced a regular sweating; his voice finally refused him further service and he quietly left the house just about the time that my patience was about to be exhausted. On this occasion he had not made use of the sacred magic-rattle or Maracca.

284. Already at break of day, the old Piai was standing at my hammock, enquiring after my health and took the opportunity of reporting in a long speech, of which unfortunately I could only understand the smallest scraps, the results of his interview with the Evil Spirit. The quinine had acted, and although still weak from the fever and the "enchantment," I sprang apparently fresh and healthy out of the hammock, so as not to upset the old man's illusions. The restoration of the Paranaghieri by the Piai aroused universal sensation in the settlement, and was the talk of the day: the old man moreover never left my side during my further stay in Nappi. A looking-glass and a small knife constituted the payment for his cure, and made him still happier. I am convinced that the Piai believes just as firmly in the efficacy of his witchcraft, as his patients do. It is said that his state of ecstasy often rises to such a pitch that he falls down faint and senseless. In my case, as the fever stayed away, the Piai's reputation was founded for all time.

285. Though every effort was made it only fell to the lot of one Indian to discover and kill a female of the beautiful *Coracina militaris,* its companions having already resumed their flight. Like the females of all *Ampelidae*, that of the *Coracina* falls far behind that of the male with regard to the feathering. The wings have a blackish, the remaining portions of the body a dirty brownish-red colouring. The crop contained the same berries which I had already found in *Ampelis carnifex, Rupicola, Chasmarhynchus, Rhamphastos, Pteroglossus* and several parrots.

286. The week fixed by me was up, and I had earnestly to think about returning to Pirara, particularly as the Indians who had been hired by Sororeng were also making preparation to accompany us to Roraima: they had only been prevailed upon to go after many repeated attempts at persuasion, for all their requirements had already been satisfied through their long intercourse with us. A chief reason for their disinclination and refusal was a war in which the Macusi and the Arekuna who occupied that territory were involved, and not only they but we also would be killed. (Sect. 376.) At first we doubted the truth of the statement because the Indian, in order to avoid being contracted for a journey that he does not want to make, will only too readily have recourse to all kinds of adventurous stories of battles, cannibal races, spirits, etc., who are said to reside in the district, whereby he hopes to

inspire fear in the traveller and make him give up the trip. On the Takutu expedition they were satisfied with some knives, combs and beads for their services: here, the risk demanded the payment of a gun. This was also the terms I promised to hire two more villagers from Nappi. So long as the Indian is still in want of something, he is the most complaisant obliging person that can possibly be found: when satisfied with what he has, he moves neither hand nor foot.

287.One of the Indians hired by me had the most striking likeness to Napoleon, a resemblance that was recognised even in Paris when the portrait taken of him by Goodall was exhibited there by my brother. We naturally immediately christened him Napoleon, a name which he was soon generally known by. It was only a short while before that he had completed his apprenticeship as a Piai, and had come to settle down and practise as such in Nappi, his birthplace, but this proved a most unsuitable district, for the old medicine-man was held in high repute. His miserable practice let him gladly accept my offer, but he took care to explain that he only did so to be of assistance to me. It was soon evident that he not only possessed a physical resemblance to Napoleon, but his genius as well. He was an excellent astronomer, knew a number of stars by name, amongst them the Southern Cross, and shewed himself later on a still more thorough geographer: above everything else, however, he was an incomparable eater, a peculiarity in which he surpassed everybody I had ever known, and later on he beguiled us with many a happy hour.

288. In company with the men who wanted to accompany us to Roraima and their wives, who were going with them as far as Pirara, I made a start on the return journey. The water had not yet fallen a single inch, and we accordingly had to overcome once more all the difficulties experienced on the outward journey. On our arrival we found the large boats already loaded and floating on the waters of Lake Amucu, ready to take our things as close as could be to Pirara mouth in the Mahu, we leaving behind at Pirara everything not required on the expedition. As it could be understood beforehand that the remainder of the villagers would take their departure after we had gone, we nevertheless considered it necessary, on account of the Brazilians, to leave someone to supervise our property: experience had sufficiently taught us that when visiting the village these people made no scruples between Mine and Thine. As none of our countrymen had a turn for the contemplative life of a hermit, it was decided to cast lots—Tiedge had to remain, and he was now supplied with provisions and with trade for the interval.

289. The chief object of our present expedition was to reach the remarkable communication-chain of the Parima Ranges situate 5° 9′ N. Lat. and 61° W. Long., for which purpose we were first of all to utilize the present favourable height of the Takutu and Cotinga so far as the latter was navigable, and only then to resume the land journey for Roraima and the sources of the Cotinga. According to the natural boundaries of the Colony the Zuruma up to the mouth of the Cotinga, like the latter throughout its entire course, were regarded as the western limits on the Brazil and Venezuela side, for which reason a more

accurate map of both rivers throughout was necessary. From Roraima my brother wanted to make another journey to the basin of the Cuyuni, to discover if possible its source, to complete its course up to the spot where he had reached it on his journey from the Barima, and at the same time to map out the western boundary in regard to Venezuela. He intended including a trip to Georgetown to obtain the fresh supplies of provisions and trade required for the fourth expedition to the sources of the Corentyne, and then to join us again in Pirara. On the departure of Mr. Fryer with the two larger boats for Pirara mouth, where we would be following him two days later in the third boat, Mr. Goodall might easily have met with an accident similar to that which befell Mr. King on the Barima. To give Fryer the salute our small mortars had already been once fired and Goodall was re-loading, when owing to the carelessness with which Moore, our Negro, had closed the touch-hole, the second charge on being poured in caught fire from a spark remaining in the powder-chamber: this blew up Goodall's eye-brows, eye-lashes, and hair off his forehead, while it burnt both of the reckless Negro's hands to a considerable degree.

290. When the third boat was laden it was evident that—with the exception of my brother who was using one of the horses that Youd and the officers had bought from Captain Leal and had had to leave behind in Pirara, together with the only saddle that we were found to possess—we should all have to foot it to Pirara mouth, because to attempt riding on the sharp back-bones of the small lean animals would be more than foolhardy. On the evening prior to our departure Aiyukante again suddenly put in his appearance. Owing to the influence, arising from dread of him, which he exercised over the Indians, we gladly accepted his offer of accompanying us, although his external friendly behaviour could not for an instant leave us in any doubt as to his inward feelings. Of the women we could only allow Sororeng's wife and another two to join us on this occasion, and these we only permitted after lengthy entreaties, because having been married but a short while before, both were still spending their honeymoon. Kate and her husband were manifestly the most handsome couple among the Pirara villagers and the former on account of her gay and lively conduct was the darling of us all. Alas, she never came home again.

CHAPTER V.

Commencement of the Journey to Roraima—Breeding Season of Mycteria americana—Mouth of the Virua, the Manucuropa of the maps—Banks of the Takutu—Friar José's Fazenda—Mouth of the Cotinga—Camp on western bank of the Cotinga—Swarms of Butterflies——Pimelodus arakaima—Delphinus amazonicus (?)—Taeniura motoro—Crotophaga major—Visit of the Elite of Fort Sao Joaquim to the Zuruma camp—River Warami—Warami Settlement—Hunting the Dicotyles torquatus and D. labiatus—Immense bed of Infusoria—Tapir-hunting—Commencement of the Cataracts—Rapids of Aratiari—River Mawitzi—Rocks Maikang-Yepatori and Arawanna—Cnidoscolus Curcas—Junction of Zuruma with Cotinga—Camp at their junction—Course of the Cotinga—Mounts Piriwai and Maikang-pati—Piriwai Cataracts—Second Series of Cataracts on Cotinga—Rapids of Panatsikameri—Natural Fountains—Foot of the Pacaraima Range—Piatzang—Overland journey—Camp at the foot of Morokai—Macusi settlement, Torong-Yauwise—Celebration of 15th October—Canis cancrivorus.

291. Morning of the 10th September, 1842, found us on the way to the mouth of the Pirara which, owing to the heavy flood-waters we had to try and reach on its southern bank. After crossing the oasis that stretches southwards from Pirara, we proceeded in a direction W. by S. over a savannah and soon came upon a bushy spot, the peculiar vegetation of which indicated the earlier existence of a settlement here, a fact that was sufficiently confirmed by the many blackened and half-charred posts. As soon as our party reached the ruins, they stood still and burst into loud lamentation crying "Caraiba, Caraiba." A lawless gang of man-hunters from the Rio Branco had some three years previously set fire to the peaceful homes and driven off their occupants to die in slavery far from their native country.

292. Getting tired on the way, we took a rest amongst these ruins whence the blackened posts rose mournfully in the heated atmosphere. It was only on the green bush surrounding the flourishing cotton and *Bixa*-shrubs that man's hand had left no traces of its destructiveness, and the refreshingly welcome verdure formed a glaring contrast with the saddened countenances of our companions who, relieved of their loads, were either squatting on their heels or standing upright and gazing at the charred timbers and broken walls. Our party were greatly depressed. This strange and really affecting spectacle reminded me much of Bendemann's beautiful picture: the Jews bewailing the destruction of Jerusalem. To banish these unwholesome thoughts we did not stay long but went on.

293. To reach the estuary of the Pirara as quickly as possible, my brother took a turn-off and was soon out of sight. The high rolling ground over which we had been travelling now became level, and

a tiresome water trip began. After something like four hours across a savannah overflooded with two, often three or four feet of water, we arrived at the junction of the Nappi with the Pirara. The Nappi still remained the same rapid and deep mountain stream, but yet it had to be crossed. To swim the raging torrent with the heavy astronomical instruments was an impossibility, and there was no suitable tree along the bank which, even when felled, would be long enough to reach the opposite shore. A raft was the only way to cross. All hands were therefore set to work, and, with the few tools that we happened to have at hand, we managed to make one in about four hours. It was with trouble that we put it into the water, only to see it sink a moment after. The freshly-cut hard timber was too heavy. The only thing now was for one of the Indians to swim the river and send him to the mouth of the Pirara so that my brother, who we reckoned would have arrived there already, might send one of the boats up to where we were on the Pirara, and so help us get to the opposite bank of the Nappi.

294. We had already spent five hours here, the sun was sinking on the horizon, and the mouth of the Pirara was still another five hours distant. The no less comforting prospect of being unable to get away before midnight became every moment more certain. Just as our boat, so smart in battling with the waves, reached the opposite shore the noise of her paddles aroused our keenest and most welcome interest which was soon changed to astonishment on seeing the craft with my brother in her: she had left Pirara village the day before and was slowly making her way down. She had proved as good a helping angel to him as to us. It would seem that when he reached Pirara River he intended riding over, but with the first few steps his horse had sunk knee-deep in the mud, turned a somersault in trying to free itself, and had thrown its rider who, as soon as he had got up and wiped the mud and dirt off his face saw his steed doing a gallop back to the settlement. He now found himself in a worse predicament than we were: for he was alone. The boat had reached him also just in the nick of time.

295. After she had put us, as well as the chronometers, safely across the Nappi, we resumed our journey over the savannah, now changed into a lake. The sun had long gone to rest, yet on and on we went by moonlight through the water until a forest belt indicated our proximity to the Pirara, and soon we recognised right ahead, but deep below us, the many fires which cast the shadows of the densely leaved branches of the old Mararen tree in strong relief over the choppy waves, and lighted up in glaring contrast the nude brown figures of the Indians squatting around them. We found ourselves upon the 30 to 40 foot high bank in the neighbourhood of Pirara mouth and a loud hurrah hastened the paddlers on the yonder shores to come and fetch us over to their inviting fires. This was easier said than done, because before getting into the corial now waiting to take us across we had to slide down this 40 ft. embankment. We, the women, Goodall and I, were already paddling towards the tempting hearths when a sudden scream immediately succeeded by the noise of a heavy fall caused us to stop. Someone must have fallen down the steep incline and the almost minute-long silence that followed made

us fear that the unfortunate fellow had met his death. We had already turned the corial round when we heard Aiyukante yelling with rage at the Indians still standing on the top, which convinced us that he could not have suffered much serious damage from his *Salto mortale.* When the poor devil was brought over to camp with the next boatload he looked the picture of misery. Several sawari-palm fronds that he had struck up against had dug their sharp prickles into his breast muscles, and these were only extracted with a good deal of pain. He swore that he had been struck in the back, and pushed over by one of the Indians. It was a real puzzle to see how lightly he had got over his accident considering that he was still carrying his 60 lb. load. My brother had reached camp just a little before us, and the first words of consolation with which Fryer greeted us, after the upset over Aiyukante's mishap had quietened down, were that he and the Indians had been almost worried to death with mosquitoes, and that consequently they, as well as the larger number of our party, had slung their hammocks in the high branches of the Mararen tree as was confirmed by the "Matti saponteng (Good-night, friend)" which now rang out from it. To spend the night dangling so far up in the air seemed too dangerous for us, and while the women lay on the ground and covered themselves with sand, we wrapped ourselves in our hammocks as tightly as possible. Fryer's words were only too true. During our previous 8-day stay here we had not found a single one of these wretched little pests, but now their number was legion, and the moonlight had made them even more bloodthirsty.

296. In the morning, the first thing to meet my gaze was the Mararen tree covered with a regular snowy mass of blossom, around which thousands upon thousands of *Hymenoptera, Diptera*, and *Lepidoptera* were fluttering, and the Indians who were swarming down it from their airy lodging. As in Pirara, so also here, in the savannah close by, the rainy season had called into being a number of plants hitherto unknown to me: among those particularly conspicuous was a new *Malvacea*, *Fugosia guianensis* Klotzsch, as well as the *Tephrosia toxicaria* Pers. called Yarro-conalli by the Indians and used by them for poisoning the Yarro fish (*Hypostomus* or *Doras*?) which is immune to the milky juice of the Haiary (*Lonchocarpus densiflorus*). In the wooded country bordering the Pirara bloomed numberless trees which would appear to be *Outea acaciaefolia* Benth., *O. multijuga* DeC. and several *Caesalpina.*

297. Since all our craft proved too heavily laden, we had to spend three days in this Mosquito Hell repairing one of the boats that we had already found on the Takutu trip, and on the forenoon of the third gladly welcomed the coffee-brown waters of the Mahu, along which our little squadron would be borne quickly to its mouth. A very interesting sight that engaged our attention along the banks of this river, just as on the Takutu, were the lofty trees with the large nests of the *Jabiru* (*Mycteria americana*). It was the breeding season. Although I subsequently found these nests in the forest oases and along the heavily timbered banks of the savannah streams, I never saw so many of them as on the Mahu and Takutu. This huge bird builds both in trees and upon rocky pinnacles, but in either case it chooses an inaccessible spot

and so it happens that both the colour and size of the egg remain unknown to me. The construction of the nest which is always built upon a horizontally projecting forked branch is quite in accordance with that of our storks. The old nest is used over again with each new breeding season which takes place in August and September. The number of young which leave the nest only in January or February is on an average two, rarely three. During incubation, male and female regularly take turn and turn about: the one like the other makes its way back immediately after satisfying its hunger and settles on the branch nearest the nest to take its share in the hatching process, or to defend it from any approaching danger with which it may be frequently threatened in the way of tiger-cats and monkeys. Considering how shy we had always found the bird in the savannah, it seemed very extraordinary that all fear was now cast aside, and that it should remain quiet with all our noisy ways and doings under the very tree on which its nest was built. Regard for their eggs and young makes them unmindful of danger threatening them. It is a lovely sight to see hundreds of these huge birds when frightened in the savannah flying in wild confusion hither and thither, right and left, until when at a height of 100 to 150 feet they will form one long file, and then soar higher and higher in a majestic flight of ample spirals until, hovering like dark spots in the azure sky, they almost disappear from sight. When they travel, they also arrange themselves in long hooked rows (*in langen Hakenreihen*) in which the leader, as with cranes, will after a time be relieved by the one immediately following. In spite of their ungainly somewhat upturned beak they are adepts at extracting the *Ampullaria guianensis* and *A. papyracea* mollusc from its shell without breaking it. The Macusis call the bird Tararamu, the Warraus Doih, the Brazilians Yuga, and the Arawaks Mora-coyasehre, the Spirit of the Mora.

298. Owing to the Mahu, the Ireng of the Macusis, making a number of bends which, when the water is high, considerably increase the strength of its current, we reached its mouth by three o'clock in the afternoon, and at the same time our old camping place on the Takutu trip. The Royal Cipher VR (Victoria Regina) shewed up clear on the smooth ashy-grey trunk of the giant *Mimosa* (Sect. 35) opposite, but the huge sandbanks had disappeared at the 300 yard wide junction, whence the waters that were rolling calmly and placidly towards the Rio Branco would be quickly carrying us down the Takutu. Behind us, on the southern bank, was the mouth of a small stream, the Yaroai, while on the northern was to be seen that of the larger Virua, the Manucuropa of the maps, which, according to the Indians, takes its rise in the Pacaraima Mountains. Departing day reminded us about choosing a camp and it was not long before we made a landing on the obliquely sloping high southern shore on the top of which we found spread out before us one of the most lovely sunset-tinted landscapes imaginable. The Pacaraima Mountains, in front of which lay the Wacuta, a small range of hills, stretched their broad outline from NNW. to NNE., while the Waiking-epping or Deer Mountain, with its strangely truncated summit and the Warami in W. by S. stood up like protecting guards. Towards SSE., the

craggy Canuku Mountains with Ilamikipang towered up above from a mass of dense verdure which the fiery rays of the setting sun illumined in a way that is met with only in the tropics. A sunset in the boundless savannah is just as indescribably fairy-like as at the moment when it sinks in the bosom of the ocean. Hardly had the Giver of the Day departed from view than the thousandfold dotted canopy of Heaven spread itself over us in all its tropical beauty. Not a breath of wind swayed the mighty tree-tops or disturbed the columns of smoke whirling from our fires or even ruffled the surface of the stately rolling Takutu which, like an immense silvery band, was winding its way through the luxuriant vegetation lining its banks. The whole of Nature was wrapped in the most impressive silence which was only occasionally broken by the Indian fishers when they hauled in their catch, or by the mournful cry of a goatsucker. But this fairy landscape brought us no enjoyment because the mosquitoes were present in swarms so awful as to make a bitter torment of the beautiful moonlit night.

299. On continuing our journey the following morning the river was still running S.W. between thickly wooded banks. Flocks of spoon-bills, now and again some pretty Orinoco geese (*Anser jubata*), as well as numerous ducks and other waterfowl, enlivened the view, and upon being scared away at our appearance circled noisily around, while porpoises sporting in and out of the water, followed the boat behind: but of the animals, the Manatis, that I was looking forward to seeing with the greatest amount of interest, there was not a trace. After doubling the sharp bend of a 12-foot high bank, formed of hardened clay, some houses came into view on the northern shore: it was the Fazenda of Friar José who had a considerable number of cattle grazing here. We stopped and received a hearty welcome from the brown and bearded vaqueiros who supplied us with milk and cheese but it was so hard that it almost made us bite our teeth out.

300. Although the Caraiba-auté (Brazilian houses) as our Bucks called them had almost a quite European appearance, the insides proved just as miserable and empty as any of those of our Indians. A few hammocks, several large clay vessels, in which the milk was kept, a hurdle to dry the cheese on, a roughly nailed table, and some large plaited baskets containing their modest wardrobe, as well as several drinking cups and pots, constituted the whole household furniture. The Senhoras and children ran around in apparently quite as primitive a condition as the Indians, while a pack of big dogs, just as friendly as their masters and mistresses smoking their small cigars, licked our hands as though we were old acquaintances. According to what the vaqueiros said, the Friar was not living at present at Fort Sao Joaquim, but at a Fazenda one day's journey up the Rio Branco. Still more unfortunate for me was the unpleasant news that the Peixe Boys, as the vaqueiros call the Sea-cow (*Manatus*) had already left the neighbourhood of the Fazenda several days before, the water having commenced falling: that during high water they usually travel up as far as the mouth of the Mahu which so many had visited this rainy season, and that ten had been harpooned. The flesh is a great favourite with the Brazilians, and the

bones scattered about, which the hungry dogs had not been able to devour only on account of their being so hard, confirmed the truth of their statement. As soon as the Takutu begins to fall a few feet, the Manatis disappear and make their way back to below the rapids of the Rio Branco. The search for more abundant food probably brings them to the Takutu where their favourite grasses, species of *Panicum* and *Paspalum*, grow, in greater abundance.

301. After a short rest and a promise from the friendly folk to send us daily a supply of milk down to Cotinga mouth, where we proposed spending a few days, we took our departure. About 3 o'clock in the afternoon we reached the mouth of the Cotinga, which comes in here from the NNW. The Cotinga is the *Christais* of the old Portuguese maps and has been generally taken for a tributary of the Zuruma: but the Macusis and Arekunas on the contrary call the river as far as its mouth the Cotinga, and maintain that the Zuruma or Zurung is its tributary.* While its mouth has a width of 290, and that of the Takutu one of 293 yards, they form when joined a stream 378 yards across. The junction lies in lat. 3° 22′ N. and in long. 60° 12′ W. We pitched our camp exactly at the junction, and on the western bank of the Cotinga where a sandbank stretched its way into the stream.

302. On the second day after our arrival my brother went in one of the boats down to Fort Sao Joaquim, in order to take the astronomical bearings of the junction of the Takutu with the Rio Branco. Fine times were the order of the day in camp because the Indians found many deer in the savannah, so much so, that on the very first occasion they went hunting, they brought back nine in the course of an hour. Everybody who owned hands and knife was now very busily engaged in butchering, cooking, smoking, and, most importat of all, devouring the big supply of game. In cutting up the venison we found does well advanced in pregnancy, which helped to strengthen my previously expressed opinion that they either throw twice, or else have no particular pairing season. Our camp resembled a real butcher's shop, but then our stock did not exactly accumulate, because the Indians continued eating day and night while Napoleon excelled himself in a most surprising manner. In consequence of this continuous slaughter and attracted by the smell and the offal, not only did the Pirai visit us in countless numbers, but the carrion crows covered the neighbouring trees where they greedily waited for the bits, not required for the cooking pot, which the Indians threw at them. The *Caracara* eagle that had joined in with them, was the cause of strife for every piece: the *Vultur papa* on the other hand was not to be seen. All the wanton tricks that had already been played at Pirara were repeated here: one of the gluttonous birds would be caught on a fishing line baited with meat, decorated with a crown and neck-ruffles of white paper or coloured rag, and like some evil spectre, allowed to fly back among its mates, to be now shunned by them like a leper.

303. We had already struck large swarms of white butterflies, flying regularly from S.E. to N.W., on our departure from Pirara.

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* This is the present-day accepted view, and the one followed in the text. (Ed.) See Sec. 335.

They were still continually increasing. In the coloration of their wings they resembled our "Cabbage White," but the thoracic segment showed up more yellow, and a black border tipped the colouring. During the midday hour and shortly before sunset they would settle down in endless numbers to rest on the muddy heaps along the bank, or on the sandbanks at the edge of the water. According to the statement of the Indians it was the developed insect of the caterpillar and chrysalis of which they were so fond.

304. The vaqueiros of Friar José's fazenda faithfully kept their word and brought us every day large vessels full of milk which with the daily increasing heat proved a veritable restorative for us. After delivering the milk they usually went fishing, and after a short interval returned with a canoeful of *Sudis, Osteoglossum, Platystoma, Pimelodus*, and other kinds. Under the *Pimelodus* were to be met two species hitherto unknown to me. One was the *Pimelodus arakaima* Schomb., or Tiger-fish, so called by the coloured people on account of its dark black spots, the Jantia of the vaqueiros, the Arakaima of the Macusis, whence the name of the species that was first made known by my brother. Like that of almost all the *Siluroids*, its flesh was uncommonly tasty. It is only extremely rarely found on the coast and below the cataracts. The colouring of its skin makes it one of the most beautifully marked of fishes. Along the back and sides a number of black spots are set on a ground colour of reddish-brown, while the belly is lighter and the dark dots less noticeable. The other was a *Platystoma*, which came pretty near *Platystoma tigrinum* except that it had the black stripes running longways instead of crossways. Associated with these fish was yet a species of sting-ray with a very short tail, but a more dangerous saw-like spine: it was *Taeniura motoro* Müll. Hen. Unfortunately, I lost not only these interesting fish, but also the large number of others that I had found opportunity of collecting throughout the trip: this was due to the dishonesty of the individual who supplied me with the spirit because when I opened the casks on my return to Pirara, the whole of the contents were spoilt.

305. However lucky the vaqueiros were in their fishing, they only obtained poor results in harpooning the porpoises that were sporting around here. In their pointed snout these differed essentially from *Delphinus phocaena* Linn. and were either a new species or else the *Delphinus amazonicus* of von Martius. I saw specimens amounting to quite 7 or 8 feet in length. The vaqueiros say that they live on fruit and small fish.

306. Our activities on the sandbank and the tempting smell of the meat had attracted the attentions of a large kaiman which, with head half out of water, stuck there watching us all day long: a companion far from pleasant which we did our best to rid ourselves of as quickly as possible. But as our bullets were of no use, only glancing off its hard skull without doing any damage while the beast would leisurely and contemptuously swim out of reach, the Indians had recourse to strategy. After cutting the two ends of a piece of hardwood about a foot long into sharp points, they tied a rope to its centre, surrounded it with strips of

flesh, and bound it all up so neatly as to make one continuous line of it: the other end of the rope was tied to a tree and the bait thrown into the water where the kaiman was to swallow it. Once swallowed, the rope which bound the flesh to the stick would get loosened, and the stick become fixed crossways in its jaws. Whether practice went hand in hand with theory I cannot say, because the pirai would not let the reptile grab the jeopardising bait, but instantly bit it off themselves. The Indians firmly maintained that they had already caught a number of kaimans by this means.

307. Though in the course of a few days the deer became more shy, from two to four were nevertheless shot daily, but we were only too glad to leave their stalking to the Indians, because we had discovered a large number of foxes in the savannah. Yet Reynard is just as smart and tricky in the tropics as he is at home: he proved a master-hand in avoiding falling into our traps.

308. Among birds, not less numerous than the *Cathartes* was the *Crotophaga major* which enlivened the bushes on the opposite bank whence their peculiar jarring note resounded over to us. The Indians say that it is only these which build a nest in common, a peculiarity that is not shared by the *Crotophaga rugirostra* Sw. and *C. Ani,* where each pair possesses its own. They are quite interesting little birds, and one can watch their busy little ways for hours. They hop nimbly around the cattle or slip through the grass after crickets and other insects: but when it comes to flying, then good-bye to their activities because the wing muscles are none too strong and soon fail them. The large communal nests of the *Crotophaga major* often contain from 20 to 30 eggs, greyish white in colour, and 1¼ to 1½ in. long, which the Indians eagerly purloin. Judging from the contents of the stomach both species feed not only on insects but also on seeds: they would seem to be particularly fond of the berries of *Psidium pyriferum* which, during the ripening season, I usually found inside them in large quantities. The uncommonly wide oesophagus soon narrows itself very considerably and then broadens out again into a maw (*Vormagen*) covered with longitudinal folds while the real and all but skin-like stomach has a glandular papillary lining. These birds were met in greatest number along the wooded borders of the savannah streams where, with plenty of noise, they flew from bush to bush: they were rarely to be seen in the depths of the forest. It is strange that they cannot stand a whistle, at any rate they will immediately fly off on hearing a person whistling. Guiana possesses the *Crotophaga major, C. Ani* and *C. rugirostra* which are distinguishable not only by the beak but also by the iris. The first has a bright green iris, separated from the pupil by a narrow yellow ring: the latter have a greyish-brown one. Were the anomalous shape of the bill to be the only distinguishing characteristic, it would not be of much value because the beak of the young bird is subject to many modifications and one might base a whole string of species on it. Its tenacity of life is extraordinarily marked because unless shot in the head or heart, the hunter can rest assured that he will never become possessed of the bird. If hit, it will run with incredible swiftness through the grass and brushwood, and

out of ten or twelve that I have often wounded at one shot, only one or two at most would be found, when I got to the place where they had been knocked over. On the very day after our arrival at the Cotinga I shot one off a tree with a rifle. The bullet had torn open the whole belly so that the guts extruded and yet the bird, dragging its intestines along, succeeded in getting away: it was only when the entrails had caught in the underwood, and so hindered its further progress, that one of the Indians succeeded in finding it some 200 paces distant from the spot where it had fallen. The young leave their nest long before they are able to fly, and hop from twig to twig in the company of the parent birds and with equal adroitness. If danger threatens, the old birds make a loud cry, but still consisting of two notes, when the youngsters will promptly spring from off the bushes or trees, hurry to the ground, and disappear in the grass. The Indians distinguish but two species: *C. rugirostra* and *C. Ani* are called Cunuba (Arawak), Owowi (Macusi), Houwi (Wapisiana), Ouih (Warrau), while *C. major* is known as Woworima (Macusi), and Cosac (Warrau). Every morning we found the sandbank burrowed all over with crickets (*Gryllotalpa oxydactyla*) an innumerable number of which must have taken up their quarters there. I have never noticed so many of these creatures as on the sandbanks of the Cotinga. The hard solid clayey ground in the proximity might well be the reason for these creatures choosing the looser soil.

309. The state of the heavens had proved fairly favourable for my brother who returned from Sao Joaquim after a three days' absence and told us that in return for the friendly reception afforded him he had invited the whole élite of the Fort to midday dinner on the day after the morrow and that the invitation had been accepted.

310. Preparations were quickly put in hand, for not only had we to provide a dinner worthy of the occasion but also to find lodging for the ladies, it having been arranged for the party to return early the following morning. A shady spot having been cleared with axe and shovel, the largest of our tents was pitched for the women and decorated outside with the English and Prussian flags. The seats of our boats served as tables and benches. These preliminaries over, we had to arrange as magnificent a dinner as possible. We made every effort to avoid supplying our guests with game from the savannah or with fish from the Takutu. We wanted to give them something to talk about for months afterwards, a wish that was rendered possible on account of our having received with the last load of provisions, some salted and boiled delicacies put up in hermetically sealed tin boxes which, as a point of honour, we only sacrificed, like the contents of our wine-cellar, on occasions like these: better to drink paiwarri than let fall the slightest suspicion on this particular day that the contents of the wooden cellar were none too plentiful. The memorable morning dawned. Adams had already drawn up the menu by early sunrise: it consisted of mutton soup, pickled salmon, green peas and carrots with bacon and turtle steaks, as well as small English pickles: madeira, port, champagne and Rhine wine.

311. Towards midday the sentries we had posted brought in the news that the caravan had reached the opposite shore, and were already getting off their tired horses to make their toilette and change their

travelling clothes into holiday costume. Our own boathands, also in clean linen, starched and combed, stood with burning match close to the loaded mortar so as to give them the salute as soon as they emerged from the brushwood on to the bank, and then to cross them over in our own boats which were also decorated in the gayest manner imaginable. Like pretty butterflies, with Captain Leal and Senhora Liberadiña in the lead, they came into view through the green bushes, jumped nimbly off their steeds, and were brought over to us under the "thunder of the guns," while several of the vaqueiros took the little horses under their care.

312. A creole Negro who belonged to the élite of the Fort rendered himself conspicuous with the foppishness of his clothes, but the real beauty of the whole show was a Senhor Simony whose dark coloured skin showed up exquisitely against his snow-white trousers, gold-spangled fire-red waistcoat and scarlet blouse. Such silly simian fondness for finery must be born in the African's blood. Some of the young women could have run Senhora Liberadiña, who was already known to us, very closely in a beauty competition, for it would be very doubtful to whom preference should be given for charmingly slim proportions, delicate hands and feet, brilliant eyes, classic noses, or pretty mouths with regularly set teeth: the only pity was that they had disfigured these by filing the incisors to a point. Their dress was just as tasty for, as I subsequently had an opportunity of observing at Fort Sao Joaquim, the favourite colour was blue, and all of them wore clothes of this nature while a very pretty material, much like our figured lace, and which every Brazilian girl crochets herself, covered the bosom. The long black hair was held up in plaits with a tortoise-shell comb, while around the bare neck hung several sweet little coral-seed necklaces, to which were attached a rosary and various relics. Senhora Liberadiña for instance wore amongst other things a piece of the true Cross which Friar José had probably cut from the first tree suitable.

313. The greeting over, we sat down to table where we really had to restrain ourselves from bursting into loud laughter because, with the exception of the commandant, forks were just as little known to all our guests as were the victuals placed before them, and, under the circumstances, it was hard to give advice although all were willing to learn. They saw how Captain Leal and we were putting them to use, and though quite anxious to follow our example, were unable to keep pace with us, and it was only very rarely that they got each bit into their mouth at the first attempt. The many fruitless manoeuvres and evident clumsiness of his friends seemed to put Captain Leal in a dilemma. The embarrassment of the ladies was also increasing, and to put them at their ease, my brother took it upon himself to propose that they should eat according to the custom of the country, *i.e.*, use their fingers instead of forks. Everything now went on swimmingly. It was on this same day that I learnt many a little habit which in Europe would be regarded as a grave breach of good manners: for instance, spitting a good deal while eating, and the frequent rinsing of the mouth, which would then be skilfully emptied in a long stream shot out to a considerable distance without rising from the seat. After dinner, both ladies

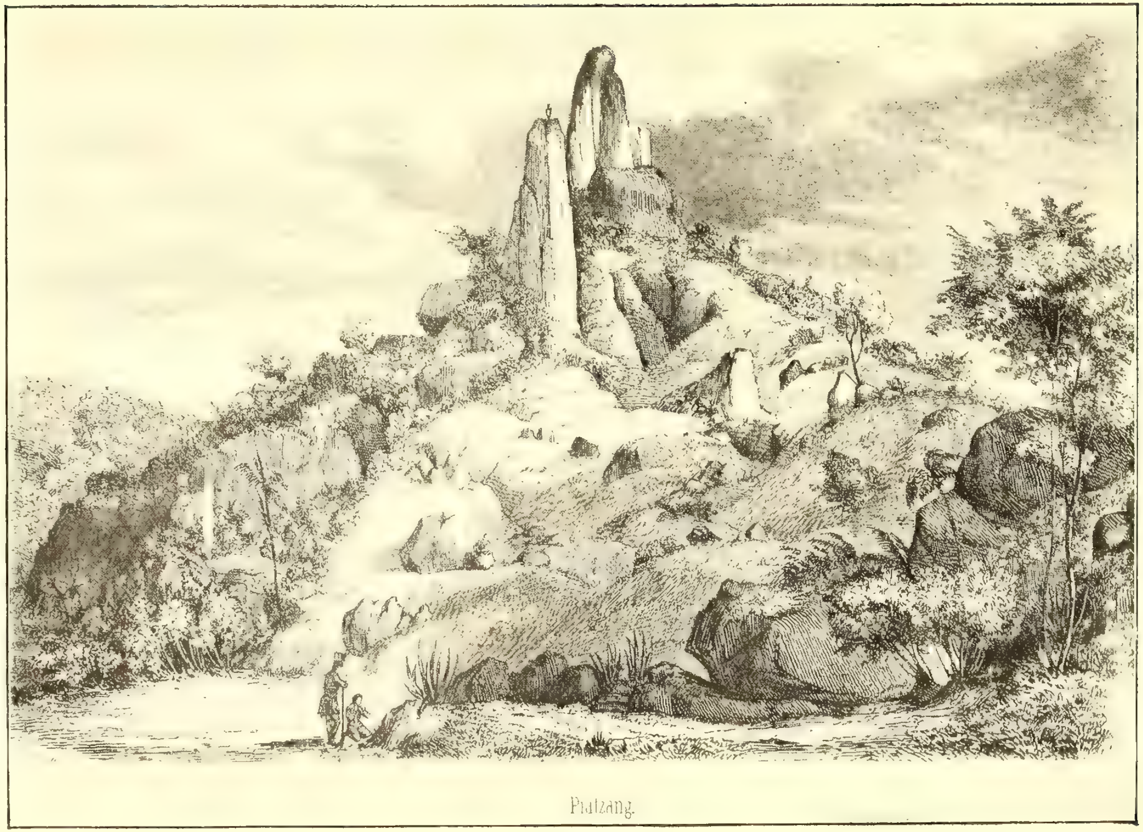
and gentlemen puffed their cigarettes, and the enjoyable day was brought to a close with singing and dancing to the accompaniment of a guitar.

314. The happy company took their departure next morning amidst plenty of shouting and salvo, but not before Captain Leal had promised to pay us a visit on our return from Roraima and to bring us himself the twelve baskets of farinha and tapioca in exchange for the double-barrel gun that he took with him. Meanwhile he had the gun, but we did not have the farinha. After taking off their Sunday clothes in the bushes opposite, the cheerful crew disappeared from sight.

315. For the past eight days the heat had again increased considerably, the thermometer on an average registering from 90 to 96° Fahrenheit in the shade. The sandbank had become a glowing hot floor for the instrument, sunk to a depth of 14 inches below the surface, shewed a temperature of 110° taken daily at three o'clock in the afternoon, and even the Indians had to protect their hardened soles with sandals: at this depth a temperature of 50° to 60° is kept up the whole night through.

316. The situation of the junction of the Takutu with the Rio Branco being now fixed, and my brother's object attained, the resumption of our journey, up the Cotinga, was fixed for next morning, and its goal, Roraima, became the subject of conversation for the rest of the day. As Napoleon had already been there once, I had the opportunity of recognising in him a geographical genius, because he readily modelled out for us in the sand a masterly contour map of the route we had to follow, of the course of the rivers we had to cross, of the lay of the mountain ranges and heights we had to climb, of the settlements we had to pass, and all of this with such precision as would later on astonish us. He represented mountains and villages, according to their height and size, with varying little heaps of moist sand, the courses of the streams with narrow or broad furrows. He took especial trouble to give us as faithful a picture as possible of Roraima. On this same day his gifts as a surgeon were also put to the best advantage, but not at the expense of my own person. One of our Indians had long been suffering with very bad headaches, consequent on a rush of blood to the head: venesection appeared to be the best cure. Napoleon understood the simple but doubtless very painful operation. After pinching up the vein lying immediately above the wrist with the fingers of the left hand, he pierced it three times with the saw-like spine of a sting-ray: naturally, upon pulling it out each time the recurved teeth increased the wound considerably, thereby releasing a fairly large quantity of excess blood, and then tying up tightly with bush-rope.

317. We broke camp on September 22nd and made our way up the Cotinga, the current of which repeatedly proved a hindrance to our onward course. The vegetation along the banks quite corresponded with that on the Takutu: flourishing Mararen trees decorated with their white blossoms towered over the dense flowery tops of some *Inga* and *Genipa americana* bushes that filled the atmosphere with their scent, and around which those beautiful beetles, the *Rutela laeta*, were swarming in countless numbers. In the afternoon, on the southwestern shore we reached the mouth of the small stream Warami where, on an insignificant eminence, lay the Macusi settlement of the same name



PIATZANG.

Some fine corials and the bad condition of our smallest boat, which we had at least made seaworthy at Pirara mouth, were the reasons that prompted us to land, and to trade for, or to borrow another one. The settlement comprised three houses and sixteen inhabitants, who were just then busy smoking large chunks of flesh. A successful hunt had supplied them with 22 kairuni (*Dicotyles labiatus*). To judge from the big heaps of bleached bones and skulls, as well as the numerous deer antlers that I found in the huts, these Indians must be passionate hunters. The never-satisfied appetite of our people had evidently allowed their large quantity of smoked flesh to dwindle to nothing and hence the unexpected glut we met here proved very welcome. Some glass beads and knives replenished our larder, while an axe was demanded by the possessor of one of the corials, which he would only supply on loan, to accompany us on the following morning and to identify the different streams, mountains, etc. for us. Although early midday, nothing would tempt our guide to forsake the fatted flesh-pots, and so we were forced to postpone our departure until the morning.

318. The two species of hog, *Dicotyles labiatus* and *D. torquatus* Cuv., the Pekari of the Colonists, appear to be distributed all over Guiana, and according to Azara, as far as Paraguay, and because the hunting of it is more productive than that of any other animals of the chase, it seems to be most often undertaken. The dogs required for it are specially trained for the purpose, which is all the more necessary as both species have an indelible dislike for them which cannot even be eradicated when tamed. The dogs are taught to pick off a struggler when a pack is met, and to try and hem it round until such time as the hunters can come up and shoot the beast. This done, the dogs hasten after the pack again, and crowd out a second, a third, and a fourth. If the hunter meets a pack, and has no dogs with him, he will sneak on to them, climb a tree and imitate dogs barking. Directly the animals hear this, they will rush with bristles raised straight for the tree whence the voice of their hereditary enemy is heard, and then encircle it, grunting wildly and gnashing their teeth the while. If the hunter has a bow and arrow, he can knock off several before the pack takes to flight: with a gun, it will shy off with the crack of the first shot. He will then quickly come down the tree, try and overtake those running away, and play the same trick again. Still furious at the interruption, the animals may again attack this tree, but they will just as surely lose another from their midst. Now and again, of course, strategy may have an unfortunate ending, as was the case with a certain Arawak who, on meeting a pack when out without his dogs, had gathered the raging beasts under the tree by imitating the bark. As he was about to shoot, the bough on which he was sitting broke: he fortunately broke his fall by holding on to a lower branch, to which he clung, but the maddened brutes succeeded in stripping the flesh off his feet that were hanging within their reach. The pain forced the poor wretch to further effort, and he managed to swing himself up again on to the branch. The pack now spent their fury on the gun that had fallen to the ground and the butt was completely bitten to pieces before they left. With indescribable pain and exertion the unfortunate huntsman succeeded in crawling back to his settlement. If

the dogs are too keen and press forward into the middle of the pack, certain death almost always awaits them, for they are generally found lying on the field of onslaught with their bellies ripped open. A similar lot befalls the puma and jaguar when they press into the pack, but they seem to recognise the danger for they usually follow at a distance and pick off the stragglers. There is great rejoicing when a hunting-party happens to come across a pack of *Dicotyles labiatus* in the river. Although the pekari swims, it moves but slowly and awkwardly in the water so that it falls an easy prey to its pursuers. As soon as the animals get into the water the Indians jump in after them with a strong stick and strike them once, very rarely twice, on the snout: the second blow is sure to kill them. They let the killed pekari float away,—it is very remarkable that it does not sink as easily as other animals—and then swim after the remainder to give them the fatal blow: it is only when no more are available that they will go and fish after the dead ones. The *Dicotyles torquatus* is much more difficult to tame than the *labiatus*, which will follow his master's every step like a dog, but will bite everything that has forfeited its good-will or that it has not learnt to understand. Both species eat seeds and palm-fruit, and like our own pigs will root up the ground after worms and insects. When the *D. torquatus* can no longer outdistance its followers, it will make for a hollow tree where possible. *D. torquatus* is called Apuya (Arawak), Paraka (Makusi), Pakira (Paravilhano), Pakitye (Warrau): on the other hand *D. labiatus* is called Kairuni, Poinka, Ipure, etc.

319. Several dried-up maize-stems, from 18 to 20 ft. long, leaning up against the huts, indicated plainly enough the extraordinary fertility of the soil. We had pitched our camp a good quarter of an hour from that at the landing place on the Cotinga, but we were nevertheless worried the whole night through with the drumming and howling of the piai who was exorcising the Evil Spirit from two fever-stricken patients whom we found in one of the huts. Curiously enough the medicine-man did not carry out his practice within the building, but went drumming and yelling around the settlement: it was a bit of luck that we did not spend the night there. Even during the last evenings of our stay on the Takutu we had heard the dull beating of the drum, which we considered to be due to a feast in some neighbouring settlement, and were wondering why the occupants had not been to see us. The riddle was now solved: the piai from Warami had been making all the noise for the past four nights, and the clear notes of the drum had been carried to us across the stilly night for a distance of over three miles.

320. As we had seen to the packing of the corial immediately upon closing the bargain, we started our journey up the Cotinga next morning in company with our newly-recruited Indian. The farther we pressed forward, the higher rose the banks. Here and there isolated blocks of rock of a rich quartz mica-schist came to light, until the banks towered above us on both sides like white walls. They were formed of a red and white infusorial clay, which our Indians rubbed into their hair and faces, so as to make the skin shiny and supple. With the appearance of this immense area of infusorial origin, the vegetation along the banks had taken on endless variation

321. It was while we were rounding one of the bends that to our great joy we saw a tapir with her young wading along one of the many sandbanks at the water's edge: hardly had the word "Maipuri" escaped the lips of our Indians, than the animals also recognised us, made their escape, and disappeared in the dense vegetation along the bank. Just as quickly as they darted away, we pulled to the shore, which we reached almost at the same time, and rushed after them with gun, bow and arrow. As we got through the forest belt we noticed that both the fugitives were trying to seek cover in the 6 to 7 foot high cutting-grass and reed that covered a boundless plain. Our pack of dogs was in the third boat slowly coming up behind, and we Europeans stood nonplussed in front of this dangerous palisade for which, from previous experience, we had a holy respect. Our Indians however could not restrain themselves but disappeared like snakes in between the awful grass. Two shots, closely following one another, and the triumphant yelling of the huntsmen, notified us of their luck. Everyone making a rush in the direction, the path consequently proved less risky for us and we soon came upon both hunters, resting on their weapons, standing in front of the older beast just killed. When the flesh was being cut up, it was seen that Pureka's bullet had pierced the lung. It was a female of unusual size. We were still crowded round the welcome quarry when a wild rush through the grass and reeds indicated the approach of the hounds who greedily licked the sweat off the beast. A hunt was now made for the young one, the trail of which was soon found by our excellent dogs. Directly the frightened creature saw itself discovered it let out a piercing shriek, but we could see nothing until its shrill cries showed that it was making for the edge of the high grass, for the open savannah, and we therefore hastened as quickly as we could to a rising ground close by, where we could see what was taking place. We had barely reached it than the animal broke into the open, followed by the yelping hounds, while keeping pace with them were our thirty Indians, whose shouts and yells almost drowned the barking of the dogs and the terrified cry of the beast. It was a strange sight, a chase such as I had never seen before. The powers of the hunted creature evidently began to wane, and now brought to bay by our grand hunting-dog Tewanau, its feet were tied by the Indians after a good deal of strong but useless opposition, and so carried back to the boat amidst deafening rejoicings and still noisier yelping. It was the size of an almost full-grown pig. In colouration, it differed markedly from the older animal which was a dark grey with blackish-grey mane whence white stripes ran along the back: the younger had a light grey ground colour with a quantity of white spots dotted over the four feet, and several yellowish white longitudinal lines on the flanks.

322. Although comparatively early in the day we pitched camp on the sandbank, so as to smoke our unexpected booty. As to the youngster, which still proved refractory, we determined upon sending it back to Warima, to have it tamed, and on our return take it on to Georgetown, and later to Europe. Under Stöckle's superintendence it left within half an hour for its temporary destination.

323. Our next business was to bring the old tapir down to the sandbank, and this required the united strength of the expedition for we had to tie a rope to the huge beast's hind legs and so drag it along, which was all accomplished with lots of noise. The length of the creature, inclusive of the 3-inch long snout, measured 6 feet 10 in., its girth around the body 5 ft. 10 in., its height 4 ft. 9 in., and the length of the forefeet 2 ft. 9 in. The tapir that grazes along the banks of the savannah streams differs so essentially, not only in respect to height, but also colour, from that occupying the coast and virgin forests, that I am inclined to believe they are two distinctly different species. The former are accustomed to leave the dense river-growth at sunset and sunrise and to tread the sandbanks, where they roll about in the water and mud like pigs do, or else eat the leaves off the bushes. Smell would seem to be the most highly developed of their senses, for they have often scented us from distances so considerable that no other organ could possibly have given them any indications of our approach. In spite of their ungainly and unwieldy form they can run at a pace that one would not credit.

324. The huge carcass was soon cut to pieces by the many bustling hands: one portion of the flesh was smoked, and the other boiled. We found the meat unusually tasty: it bore much resemblance to beef not only in taste, but also in appearance. It was on this occasion that I noticed for the first time that the Indians knew how to prepare just as good sausage as we do, for while we removed the guts, they carefully collected the blood, mixed finely cut-up bits of meat with it, and then filled the entrails with the mess: they did not cook the sausage, but smoked it forthwith. I tasted it once—but never again. Since I could not override the definite instructions given me not to forward any skins of the larger mammals to Berlin, I handed the hide over to the Indians to make sandals of: I prepared the skeleton for the Anatomical Museum.

325. While busily employed in cutting away the flesh, large numbers of vultures, that had been drawn one at a time from all four quarters of the wind, were watching from the nearest trees whether anything would fall to their share. The pirais were also darting through the water-edge and bit clean off two of the fingers of poor Pureka just as he was washing his bloodstained hands, so that the unfortunate fellow could not use them for a large part of the journey: he suffered considerable pain at first.

326. During the night Stöckle returned from Warima and brought us the news that Friar José would be coming along in the morning to see us once more, and indeed he arrived before we left. He was heartily sorry that owing to his absence from the Fort he had been unable to partake of the sumptuous banquet at the Cotinga, because it was unlikely that there would ever again be such a favourable opportunity of being invited to a similar one. To compensate him a little for the loss, we collected the remainder of our delicacies, which he found very acceptable to his palate. Some baskets of farinha, two turtles, as well as a quantity of feather ornaments from the Pauixana, Guinau, and Oewacu, including two feather-decorated

hammocks upon which he certainly placed a high enough value, proved a very welcome exchange. Having heard from the commandant that my brother on his return from Roraima, would be going to town, he asked him to bring back a few yards of black material for an altar-cloth, and two glass shades for the lamps that were always kept burning in both his churches and which were being blown out every minute by the strong draughts. After making this request, he brought out a large musical box which he assured us had hitherto given the only right tunes for the Mass, because, without it, his Indians could now and nevermore bring out the responses. For a long time past it had denied him this service, but he trusted that we jacks-of-all-trades might be able to get the stubborn thing to work again. This, however, was an impossibility because the rollers and springs were so worn away as to prevent any repairs being even thought about. He received this information almost with tears in his eyes, and, if only to cheer him up again a little, my brother made him a present of a couple of bottles of wine which completely effected the purpose intended.

327. After a stay of some hours, he took his departure for Sao Joaquim, and we continued our journey up the Cotinga. The turns of the river were continually getting shorter until at last, deflected by the small mountain Wanakara, rising on its western shore, to almost a right angle out of its southerly course, it turned to the east. Immediately above this bend, the River Murawai flows into the Cotinga on its western bank. The 20 to 30 ft. high red and white river-banks, formed of the infusorial clay, constitute a veritable fairyland with the endless number of small crystal-like cascades sprinkling out of their sides at about 3 or 4 ft. above water-level. These are probably fed from the sheets of water in the savannah : they lend infinite charm to the landscape.

328. Up till now we had only had to contend against the strong current which on the 28th September, judging from the mass of white foam-flakes that were wildly careering around, indicated that greater tasks were awaiting us, and Aratiari, the first rapids, soon came into view. After several hours of indescribable labour we fortunately got the barrier behind us. Its rocks are mainly composed of gneiss containing little quartz but much felspar and alternates with large boulders of quite recent formation, a brown sandstone interspersed with small bits of jasper. The sandstone blocks again showed that peculiar glazed crust that we had noticed so frequently on the rocky masses in the Essequibo. We had only just made smooth water when we had to look around for a camp owing to Mr. Goodall being attacked with fever. The boundless savannah closed us in on the East, South and West, while the bleak Pacaraima Range, to which we were ever getting nearer and nearer, towered in front of us on the North. The grass reached a height of from 4 to 6 ft. while the banks were bordered with masses of *Acanthaceae*.

329. Next morning we crossed over to the mouth of the Mawitzi which, emptying itself into the Cotinga from the North East, has its source in the Pacaraima Mountains where under cover of some immense

rocks it bubbles out as a small stream to divide immediately into numerous cascades some of which have a perpendicular drop of over 12 feet.

330. The guns as well as the bows that were laid aside ever since the tapir hunt had to turn out on active service to-day. Two species of blossoming tree-like *Inga* had drawn an immense quantity of insects around, and these had in turn attracted an unusual number of Iguanas (*Iguana tuberculata*, Laur.). At every stroke of the paddle, as we proceeded on, three or four of the large creatures would fall from the trees into the water, or else slipping from branch to branch disappear as quick as thought into the thick foliage of the tree-tops, a place of refuge which did not protect them from the keen eyesight of the Indians or their really accurately-shot arrows. All was now life and movement, for it was a case of getting the pots for the day's meal crammed as much as possible with some of the finest delicacies imaginable. Shooting with the gun was not so productive of good results as with the bow, because if once hit with shot and not immediately killed, the animal would straight away drop into the water and not be seen again, a trick which the 6 ft. long arrow prevented. Amongst the catch were to be found several that were from 5 to 6 ft. long, and a foot in girth. In spite of its terrible appearance, the flesh, as already stated, is one of the most delicate procurable: the eggs are similarly also very tasty. These desirable qualities, as might be expected, are continually contributing to the ever increasing rarity of the animal in those areas where, as on the coast, both Europeans, coloured people, and blacks associate themselves with the Indians in the progress of its destruction.

331. After our butchery had driven all the four-footed occupants off the trees, and we had successfully made our way over a few considerable rapids, camp was pitched and the spoil cut up. In the crop of the iguanas I found *Inga* leaves as well as insects, but there was more of the former. Next morning hard work commenced afresh, for we had to manoeuvre a regular series of cataracts, among which the Worokoi-Marari and Warara Sararu, on account of their height and the raging current, robbed us of quite half a day before we could haul the empty boat over them. Between the rocky barriers that crossed the river and for the most part consisted of felspar but of very little mica, or else of granite with felspar of two sorts and black mica, lay whole heaps of a red rounded-off kidney-shaped jasper rubble. To while away the time during the hauling of the boat over the rocks our Indians fired the savannah grass, over which, on account of the abundance of fuel, the mighty columns of smoke spread to a tremendous extent. Along the very banks of the river there stretched regular flats of the beautiful legume-like *Cassia* (*Chamaecrista*) *filipes* Benth., the charming *Pavonia angustifolia* Benth. and the welcome *Abutilon Lucianum* Sweet.

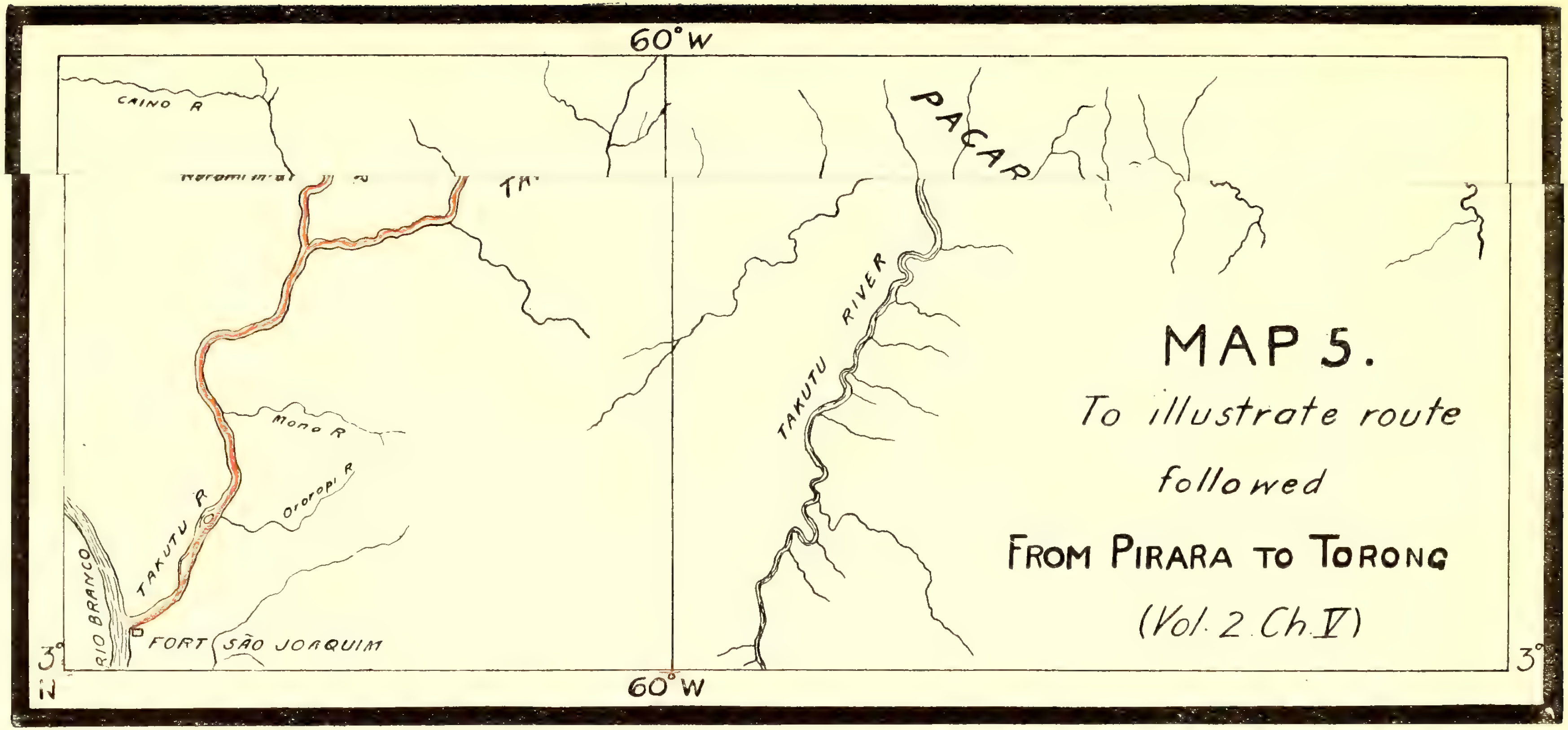
332. Even during the next two days following, we could only make 8 miles over the almost uninterrupted series of cataracts, for hardly had we packed our boat again, than we had to unpack it afresh. We had already on 29th September observed to the northward a small group of bare rocks: on 1st October these were within 2 miles of us, and

turned out to be a regular network of granite walls and dykes—formed of fine-grained gneiss, a green quartz-bearing felspar porphyry, and a dense felspar rock—that divided the bed of the river into innumerable streams, each of which, with deafening noise and tremendous force, was dashing its way through the irregularly heaped-up boulders or was trying to pass the now rising cliffs to be again obstructed by some deflecting cross-current, thus making of the whole stretch nothing else but a boiling cauldron of foaming roaring water.. Only the falls of Achra-mucra could bear comparison with this wildly romantic almost demoniacal upheaval of the waters down upon which there gazed with solemn mien on either side of the foaming surge, the 400 ft. rocky heights of Maikang-Yepatori on the eastern bank, and of Arawanna on the western: Sirikuanta follows the latter at a trifling distance. They lie 3° 53′ N. lat. and 60° 19′ W. long. Maikang-Yepatori has a more elongate shape as compared with Arawanna, which has a rounded-off one. Bravely but perspiringly we climbed to the top of Maikang-Yepatori and found our labours rewarded a thousandfold in the imposing and surprising landscape and panoramic views. At our feet there thundered and foamed the raging body of water wrestling with itself and the rocky cliffs at the same time that, like a crater belching forth the stony fragments freed from its entrails, it spouted and scattered the spray clouds and foam-flakes into the air to build a continual change of innumerable rainbows only to disappear as rapidly as they were formed. Far away in the distance, E. to N.W., there towered over one another the sombre bluish masses of the Pacaraima Range the bare tops of which, lying farther back, had been hitherto hidden from us in the plain. Exactly to the NW. high above the range, there rose a cone-shaped mountain with blunted top, Zabang, which the Indians following us greeted with the exclamation "Makunaima-auté" (Home of the Great Spirit.) A second Makunaima -auté, the Curapua rock showed up to the NE. in the distant savannah. Every high peculiarly-shaped mountain or crag would seem to be the residence of the Great Spirit.

333. Some miles in front, towards the north, we noticed the junction of the Zuruma and Cotinga, enclosed by the thick vegetation along their borders, beyond which Mt. Maikangpati and the isolated mountains Waiking-Epping and Piriwai, raised their heads on the eastern and western shores respectively. We could follow the silver ribbon of the Cotinga, our new course, up to where it touched the Pacaraima Range. In the SSE. and SW., as far as the eye could reach, an immense plain, like a green sea, stretched away to the horizon into which its limits, now no longer visible, merged, while the dense timber-belt of the Cotinga and its tributaries, followed a snake-like course through it, also to become finally blurred in the distance. Dark rising columns of smoke, which enclosed Mt. Wanakara in white circles—we had passed the base of this mountain several days before—indicated that the savannah fire lighted by our Indians shewed no diminution but had spread far, far towards the S. and S.E. After we had had our fill of the lovely landscape and erected a 60-foot pole with flag to be used for trigonometrical measurements at the junction of the Zuruma and

Cotinga, as well as perhaps to show in after years that Maikang-Yepatori had been visited by Europeans, we made the descent. A number of rounded shallow excavations, which really seemed to have been cut out with a chisel, and were scattered over the whole side of the giant crag, next engaged our full attention, yet without our being able to understand their sources of origin in so hard a rocky material. The more desolate the slopes of this craggy mass on which only amongst the isolated chinks and crevices where a little humus had collected, some *Melocactus* and dwarfish *Cassia* dragged on a miserable existence, the more luxuriant did the vegetation prove in between the boulders scattered around its base: the only exception to prove this rule was the delicate *Pteris euchlora* Kze. sp. nov. a fern which, no sooner called into being by the moisture of the tropical winter and given time to fructify, is doomed to be scorched to death by the very sunshine of which it is so shy. It was only after long and fruitless search that I was able to find some fresh specimens in the fissures of the rocks and under the boulders resting one on top of the other. The base of the westerly rock, Arawanna, which we also wanted to climb, gave us some interesting botanical results, for we not only found a new shrub-like *Cassia* with large bright yellow blossoms, *Cassia arawanna* Schomb., undoubtedly one of the most beautiful representatives of the family, but also discovered in between the sharp gneiss and granite boulders what I might almost call a tree-like plant, a find that gave me more than a week's painful remembrance. The thick legume-like stalk, lightly hirsute leaves and white homely blossoms looked so strange that I put out my left hand to pull off a twig so as to get hold of some blooms. Had a snake bitten me, I could not have withdrawn it quicker or stared at the bush in greater terror. An awful burning pain, just as if I had seized glowing hot iron, shot through my hand, which immediately started to inflame and swell, lasted for the next six days, and even then forced me to treat it with care. The frightfully armed plant works its venom even through linen breeches. A bad attack of fever supervening from it soon after embittered for me what would otherwise have proved so profitable a day for the enjoyment of Nature. It was the *Cnidoscolus Marcgravii* Pohl.

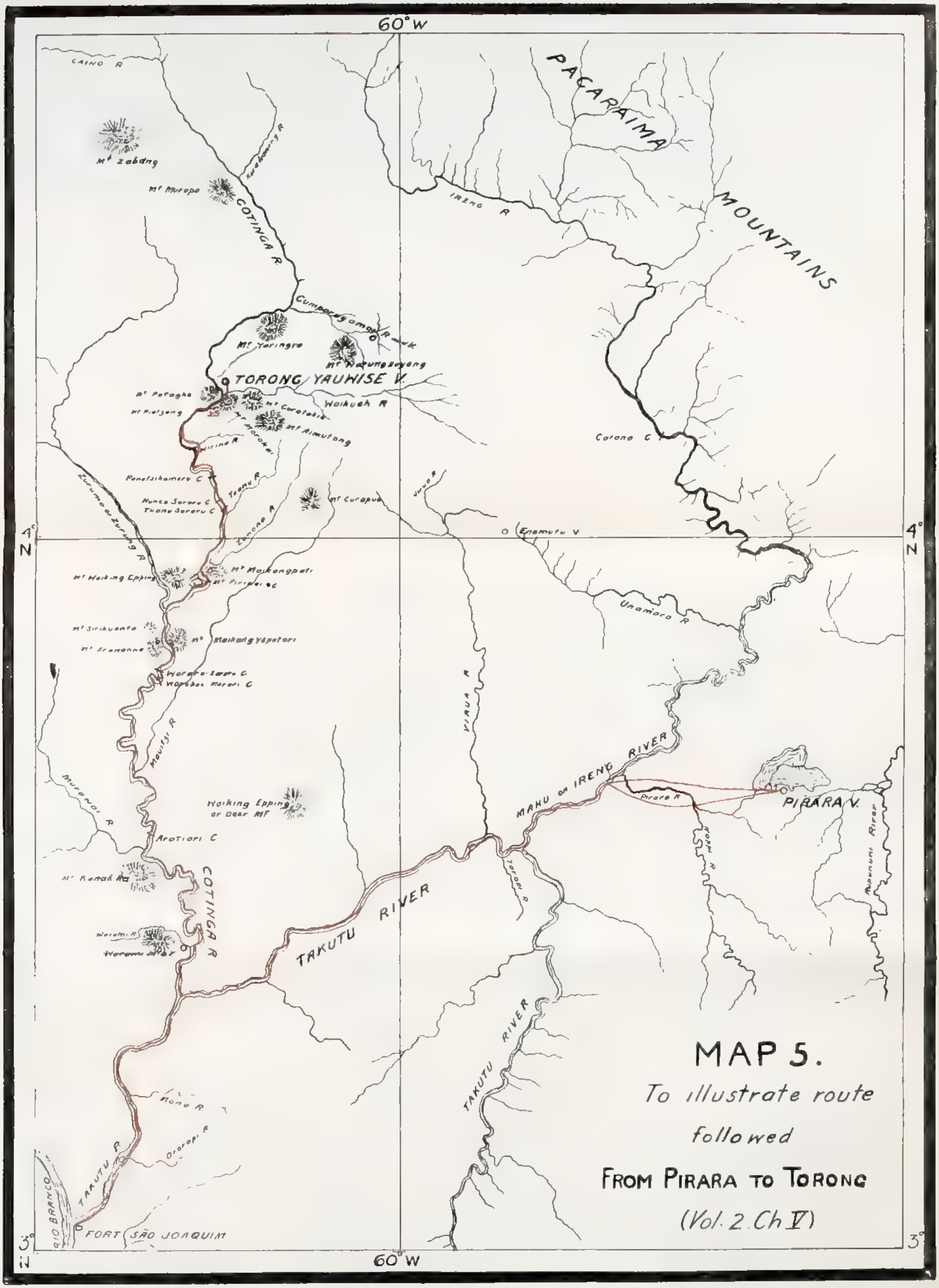
334. Owing to the long series of cataracts that still stretched their course along the river beyond the rocky heights, as well as the lassitude consequent upon their climb, we considered it more advisable to postpone, until the day following, the heavier task of hauling the boats over this roaring mass of water. Cleaning up with cutlass a spot in the dense confusion of *Papilionaceae, Mimosae, Cannaceae, Zingiberaceae* and *Piperaceae,* we pitched our tents. The Cotinga provided the other members of the company with some fish, but the pain had driven all hunger out of me. Sunrise found the people already exerting their utmost endeavours, and after the lapse of a few hours their labour was completed, and the cataracts fortunately lay behind us. As I could lend no assistance on account of my sore hand, I walked along the banks where, amongst the rank and flowering *Mimosa, Apeiba, Byrsonima,* and *Lecythis,* I discovered an extraordinary tree-like *Papilionacea* in very complete bloom, which besides the beauty of its flower, possessed an



MAP 5.
To illustrate route
followed
FROM PIRARA TO TORONG
(Vol. 2 Ch. V)

60° W
CAINO R
TA
PACAR
TAKUTU RIVER
Mono R
Ororopi R
TAKUTU R
RIO BRANCO
FORT SÃO JOAQUIM
3°
N
60° W
3°

V. ROTH, del.


60° W
Caino R
PACARAIMA
MOUNTAINS
Mt Zabang
Mt Mirapo
COTINGA R
Ireng R
Cumboregomo R
Mt Yaringra
Mt Natungbayeng
TORONG YAUWISE V.
Mt Patagha
Mt Pielyang
Mt Carotakin
Waikuah R
Mt Marakei
Mt Aimutong
Iririne R
Corona C
Panetsikamara C
Tuanu R
Munca Sarara C
Tuanu Sararu C
Mt Curapua
Juua R
4° N
Zuruma or Zurung R
Zanone R
Enamutu V
Mt Maikongpati
Mt Haiking Epping
Mt Pirimai ec
Unamara R
Mt Sirikuanta
Mt Maikang Yapatori
Mt Kramanna
Warara-Sappa C
Warakai Marari C
Maulgi R
Virua R
MAHU or IRENG RIVER
Muranai R
Waiking Epping or Deer Mt
Pirara R
PIRARA V.
Arotiari C
Mt Kurak Ra
COTINGA R
Torobi R
Ireng R
Rupununi River
TAKUTU RIVER
Waromi R
Waromi Mt
TAKUTU RIVER
Mono R
Orarapi R
TAKUTU R
RIO BRANCO
FORT SÃO JOAQUIM
3° N
60° W
3°

MAP 5.

To illustrate route followed

FROM PIRARA TO TORONG

(Vol. 2. Ch V)

V. ROTH, del.

uncommonly pleasant scent.. A quantity of empty turtle carapaces, each with a round bitten-in hole, indicated the presence of the "turtle tiger" in no inconsiderable numbers.

335. After proceeding some miles on the placid surface of the Cotinga we reached its junction with the Zuruma that rolls into it from the NW.: the Cotinga comes almost direct from the North. Both streams at the junction have the same width. As I have already stated, the Cotinga is the Cristais of the old Portuguese maps and is generally, but as it appears to me, wrongfully regarded as a tributary of the Zuruma, a view that the Indians also reject, for they look upon the latter as a tributary of the former, and call the whole stream which we covered from the Takutu also by the name Cotinga. (Sect. 301).

336. As I mentioned previously, the trigonometrical bearings of the junction had to be taken: owing to Mr. Goodall having a fresh attack of fever we were forced to make a stay of several days. We pitched our camp on the edge of the eastern bank of the Cotinga close to a fair sized sandbank. On reaching the first rapids of the Cotinga, the mosquitoes had disappeared, but this vouchsafed us little or no relief, because they were immediately replaced by similar shoals of sandflies that worried us from sunrise until sunset. We had considered it impossible for there to be any increase in the torments hitherto suffered, but yet, in our case, this impossibility turned out to be a reality. Any sedentary employment became real torture and was rendered still more unbearable by the scorchingly hot rays of the tropical sun, exposed to which the thermometer indicated 140° Fahr.

337. Unless we wanted to be bitten all over, it was impossible to stay in camp during the daytime: the savannah fortunately provided us with a place of refuge, and at some distance from the river our troubles disappeared. An extraordinarily large number of small duck, *Anas viduata*, had collected on one of the sheets of water that still covered the savannah, and the Indians commenced a merciless onslaught on them. Not only on account of this pleasant intermezzo did the savannah prove of interest, but also on account of the cone-shaped 12 to 16 ft. high ant-hills, built from the infusorial clay soil, which, in between the isolated *Curatella* trees, covered every bit of rising ground that the flood waters had left exposed, like a friendly military encampment, and lent to the otherwise monotonous level surface an extraordinary animated appearance. Upon the areas whence the waters had already receded grew innumerable Gentians, such as *Lisyanthus uliginosus* Grieseb., *Coutoubea reflexa* Benth. while on other flats again were to be found the glorious *Schultesia brachyptera* Chamss. forming a lovely flowery flooring with a really imposing appearance. Amongst them I also found two new species *Schultesia Benthamiana* Klotzsch and the but 4 to 6 in. high *Schultesia subcrenata* Klotzsch.

338. As I had been unable up to now to clean all the flesh off my tapir skeleton, on which account it was stinking horribly, it seemed to me that I could not do better than call upon the more effective help of our terrible enemies, the pirai. Attached to a strong line, I left it tied to the big boat in the water, but found on the following morning that the

rope had been bitten through and the skeleton gone. The Indians dived down and examined the river bottom, but in vain: my carefully prepared treasure had disappeared. But who was the impudent thief? I had ascribed a loud splashing during the night to the fishes. Every search and enquiry remained fruitless.

339. The trigonometrical survey was completed, Mr. Goodall recovered of his fever, and we intended resuming our journey on the following morning, a time to which we were keenly looking forward while lying in our hammocks with hands and face thickly wrapped in towels around which thousands upon thousands of the plaguey little devils were swarming to find an uncovered spot, when Awacaipu, our Arekuna, marched into the tent and asked for the "small gun" (*Kleine Flinte*), as they call a rifle. In reply to our questioning what he wanted it for, he said that he had noticed a whacking big creature below the old tree trunk that stretched out over the water a few paces from the camp. Being inquisitive, we, with other Indians, accompanied him to the spot and certainly recognised a huge head, but owing to the strong ripples on the surface which often magnified, often diminished it, we were at first unable to make out whether it belonged to some unknown reptile or to a fish. Our valiant Hendrick quickly picked a favourable spot and fired at the doubtful monster which, angrily striking with its tail and body writhed in convulsions, sank to the bottom of the river. After the surface had become smooth again, one could see the dark body lying in the none too deep water, without, however, our being freed of the uncertainty as to what sort of an animal it was. It was now up to us to bring the puzzling creature to land: we could expect no assistance from the Indians for they had all collected at some distance from the waterside where they watched our proceedings with fright and surprise. According to Awacaipu's account the monster could be none other than the *Tuna-mama* (Water-mama), the Spirit of the River, which they universally dread. As Hendrick's call to them for assistance was in vain, he himself found a means of raising the creature out of the water, and after several attempts drove a strong harpoon-like arrow into its scales. The heavy carcass rose under our united efforts when the claws of a kaiman appeared on the surface. The vigorous movements of the leg, as well as the powerful jerking and tugging showed clearly enough that the animal had in no way breathed its last. Another bullet, skilfully shot by Hendrick between the neck and shoulder, made us let go of the harpoon owing to the tugging having become too strong, but the white of the belly which soon shone up at us from below, indicated that the object desired had succeeded. As soon as the Indians were convinced that what Hendrick's stalwart arm had wounded was not a Tuna-mama, they all came to help: a corial was brought up, one of the fore-legs was soon fastened to a rope, and the huge beast dragged on to the sandbank. The sunshine seemed to give it a new lease of life, for though believed to be dead, the brute began to stir, put up a threatening defensive, and drove all of us out of its immediate vicinity. When the flying column returned to its post, a council of war was held as to how best to seize and overpower the beast. The resolution was passed quicker than I thought. Several Indians hurried off and returned with long thick heavy poles: the most daring of them

rushing with one of these on the slope at the animal that was waiting for him with open jaws, drove it down its throat. Although the kaiman clenched its mouth vigorously and bit deep into the pole, one would judge from the deep grunting, that it did not appreciate the trick. Two other bold Indians had in the meantime sneaked upon it from behind and now let their blows fall on the root of the tail. With a wild snapping the animal raised itself up at each blow, and wrenched open its horrible mouth, only to receive immediately another pole driven in by his courageous combatant. That the root of the tail, which the Indians maintain is the seat of life for the kaiman, is one of its most sensitive parts, was shewn by the fact that with every blow struck here it would hold itself up in rage, but pay no attention to the innumerable hits that fell on its head and neck. After a long and strenuous fight, the thief who stole my tapir skeleton was finally shot: the girth of its body was 4 ft. 4 in., length 11 ft. 3 in., that of the head 3 ft. 6 in. The tail measured 5 ft. 6 in. As the shortness of the time did not permit of my skinning it, I had the carcass drawn up into the bush where the carrion crows would save me the trouble of doing it, and have the job well finished on my return.

340. The number of fresh jaguar tracks which we found every morning on the sandbank, shewed that it must be quite a favourite resort from which neither our presence nor that of our numerous fires would drive them away. According to our observations the junction of the Zuruma and Cotinga is 3° 54′ 37″ lat. N. and 60° 19′ long. W. Immediately at the line of communication of the two streams, the temperature of the water of the Zuruma is 1° colder than that of the Cotinga.

341. We had never looked forward to the resumption of our journey so anxiously as we did here. Daybreak on 3rd October was hailed with delight: to-day we were to be released from purgatory, and our corials soon skimmed their way up the Cotinga. Numerous crags that pushed their way up through the river-bed in all directions obliged us to be continually crossing, so that we made but slow progress in reaching the two mountains Piriwai and Maikangpati, between which the river forced its passage. Upon the summit of the 400-ft. high Piriwai,—its slopes covered with huge granite boulders in between which a luxuriant but not dense vegetation shot its way,—stood two immense granite columns, like a couple of huge watch-towers, that reminded me very much of the Comuti or Taquiari rocks of the Twasinki ranges on the Essequibo. The lonely Waiking-Epping (Deer Mountain) towered over the savannah N.W. of Piriwai while a rocky stratum that cropped out above the surface on Piriwai also made its way through the river-bed and gave rise in front of us to a foaming and tumultuous sheet of water as well as to one of the most dangerous and roughest series of cataracts that we had hitherto had to contend with. After the name of the mountain, the Indians called them the Piriwai Rapids. Before reaching them my attention was drawn to an animal rising out of the water, which I recognised as a dolphin: the presence of such an animal above the formidable cataracts of the Cotinga was just as unexpected to

us as it was to the Indians. In spite of the real platoon-firing directed upon its momentarily-exposed back, into the broad surface of which several bullets made their way, we did not succeed in getting possession of it.

342. The boats had to be emptied and the baggage transported along the banks. Between the fissures in the rocky dykes we noticed a number of dead turtle which, probably unable to withstand the strength of the current at high water, had been driven betweeen the crevices, jammed in there, and died of hunger. While our crews were busily engaged hauling up the corials I hastened to the foot of the Piriwai to see if there was anything new in the botanical line, and hardly had I made my way across the river bank which was overgrown with the pretty *Quamoclit coccinea* Moench., and decorated with thousands of beautifully brilliant purple-red blossoms, and reached the adjacent open savannah, than the glorious azure blue flowers of the lovely *Ipomea evolvuloides* Moric. and *Jacquemontia hirsuta* Chois. lighted upon my gaze. Their immense number lent an endless charm to the extensive plain, but the wildly romantic surroundings of Piriwai's peculiar mountain-base surprised me more. Above the large-leaved *Pothos* and *Tillandsiae* there towered blocks of a coarse-grained granite often 50 to 60 feet high, likewise covered with the rocky vegetation already often described, amongst which I also discovered a new species of *Strychnos, Strychnos Schomburgkii* Klotzsch, from the bark of which the Macusis make their urari poison. To climb this protective zone of rocky boulders irregularly piled one on top of the other so as to reach the two gloomy watch-towers would have required more time than I could afford: I could only gaze at them from below and see a lonely bird of prey circling round them.

343. When I returned to our people, I found that the cataract had been overcome and the tired chaps busy over their breakfast which consisted of several large *Silurus* that had been caught during my absence. After we had doubled round Piriwai along a sheet of water continually broken by projecting rocky tops, we saw that the mountain had turned the stream some considerable distance to the south-east. Maikangpati, which rises at some little distance from Piriwai on the western shore, gives rise, like it, to a few, if only insignificant, rapids. Close to its northern base, the little stream Zunona empties into the Cotinga.

344. It was already almost 14 days since we had left the settlement at Warami, and from what the Indians told us, we could hardly reach the next village under six. The supply of cassava bread and farinha was already markedly diminished, and the rations had to be reduced to half, although our troubles were increasing practically every hour because in front of us was an almost impassable cataract and not a single mountain to the right or left, but only the flat savannah stretching along both sides of the bank. Since the tapir no game had been seen: the huntsmen who strolled along the banks into the savannah, returned in the evening just as empty-handed as they had started in the morning. Napoleon and others apparently as greedy eaters as himself, began to growl, but this did not help them much.

345. The 3rd and 4th October undoubtedly proved the most fatiguing days we experienced during the whole of our Cotinga trip. In spite of

the continued and extreme labour we managed to cover six miles between morning and evening of the latter date: during the former we had to discharge the boats three times on account of the height of the falls, and even then it was only with the greatest trouble that we succeeded in hauling them over. The dykes consisted throughout of a fine-grained granite, or a similar grained gneiss.

346. While engaged on the evening of October 4th in ascending the last of these cataracts, for the placid waters beyond were smiling at us, some thin columns of smoke on the bank indicated the presence of human beings, who were soon recognised by the sharp eyes of our companions. Everyone's muscles and sinews were strained to the utmost now that meat and an additional allowance of bread were probably procurable. Our hope for game proved to be in vain, because we found it to be a small party of Macusis, from the Pacaraima Ranges, who were engaged in fishing at the junction of the Tuanu with the Cotinga: in the course of a few minutes we owned the whole of their catch, both smoked and fresh. We learned from them that we would reach their settlement within three days, but that with the innumerable rocks, rapids, and cataracts, this was an impossibility if we went by river. We were the first white people they had seen, and hence, especially for the children, constituted objects of the greatest astonishment. Camp was now pitched in the open savannah which seemed to extend to the river-side and was only separated from the water-edge by a 2-foot wide fringe of vegetation. We saw and heard nothing in front of us but the wildly tempestuous masses of foam and the heavy roar and thundering of the unloosened elements:—we had to make our way through this next morning.

347. The Pacaraima lay now only from 5 to 6 miles ahead and our eyes rested in supreme ecstasy on the charmingly romantic scenery of these mountains the slopes of which presented a picture—to which several extensive provision-fields in their close proximity undoubtedly contributed a good deal—wherein the bright succulent verdure offered the most lovely contrast with the dark foliage of their bases.

348. As we were about striking camp next morning, Napoleon and another Indian, also from Nappi and an equally greedy eater, had disappeared. The dwindling stock of provisions must have presented itself to their very heart and soul in the guise of some Evil Spirit which had driven them off without so much as asking payment for their very strenuous labours. The gloomy prospect of fast-days was enough for them to forego everything they were entitled to demand, in order to hasten back as quickly as possible to the flesh-pots beckoning them back to Nappi. The others soon found their tracks: these showed that both had made their way over the savannah towards the mountains. As we learnt afterwards they had hurried to the three-days-distant settlement of Torong-Yauwise, had got a quantity of bread baked there, and had already resumed their return journey before we ourselves arrived in the village. The gaps which their flight had caused in our crew were readily filled by two of the Indians whom we had come across.

349. Work and trouble commenced with break of day: the two important falls Tuana-Sararu and Nunca-Sararu (Sandfly cataract) fol-

lowed immediately one after the other. They were fortunately mastered and we already believed we had accomplished the work when we once more saw in front of us as far as the eye could reach, a single foaming loudly-roaring mass of water, that was sufficient to quail the stoutest heart. Was it really possible to find a way through? The Indians called these rapids Panatsikameri. Close to the edge of this hellishly-roused element our keen attention was drawn to some three-cornered columns of an unusual fine-ground gneiss which, thickly crowded against one another, rose a few inches above the present surface like giant prisms. On landing our boats here, the Indians assured us that it was impossible to bring the corials over such a tumultuous pool, where the raging current was breaking on thousands of reefs: although this assurance corresponded so closely with our fears, we would not by any means despair of at least piloting the empty corials through, notwithstanding the fact that we were unable to recognise the slightest change in the mass of foam for at least a mile ahead. The baggage had to be carried along the banks, the execution of which orders it almost seemed as if the Indians were about threatening to disobey, with the result that we had to exert every effort in extinguishing the glowing sparks of rebellion: and yet in our hearts we felt the deepest sympathy for the poor fellows because the heavy boxes fitted up for water and not for land transport, had to be conveyed for quite half an hour over an uneven and swampy piece of ground. Of course we did not dare express our sympathies, or flinch a finger's breadth from our orders, unless we had wanted to make slaves of ourselves at the will of our subordinates. Towards evening, the Impossible had been rendered Possible, and a tot of rum, together with some other little gifts, recalled from its temporary flight the good-will of the gallant Macusis: laughing and joking we continued our journey in smooth water until the evening's close when a favourable camping-ground tempted us to take our night's rest.

350. Next morning the early rays of surprise poured upon the Pacaraima Range, now only a few miles distant, a really magic purple lustre, the wonderful effect of which held us for long in dumb astonishment until at last the scorching orb appeared full above the horizon, and we resumed our journey over the still smooth water which was all the more surprising as the cleft mountains lay but a few miles ahead.

351. With every forward stroke of the paddle, the western bank became steeper and had soon reached a height of 25 feet, when there again sounded on our ears the dull roar of rushing waters which gave us a presentiment of further troubles; but on this occasion our fears were groundless, because it was due to a jet of water 2 feet in diameter springing from out of the steep rocky wall at a spot about 15 feet above water-level, whence it poured in an arch into the stream. On a smaller scale, we had already met with these peculiar phenomena in the lower reaches of the river. The impression which this really imposing natural display evoked, had spread to the Indians, because they seemed to be seized with some holy terror as we made our way past the water-chute: their previously noisy voices were still, and with cast down timid glances they put vigour into the paddles, so as to get away as quickly as possible from a spot so terrible for them. The hereditary enemy of mankind, Kanaima, says the Indian

legend, was being pursued by a powerful Spirit: so closely was he pressed that escape seemed impossible and the steep bank which hindered his further flight over the surface of the ground, formed his only chance. He dug his way into the bank, bored his way underground for a distance of 10 to 12 miles and emerged on the left or northern shore of the Zuruma so that, rescued from destruction, he still continues to torment the human race. As a matter of fact a similar opening is found, in the steep bank on that side of the Zuruma, with a similar water-spout.

352. Though finding an ample resorvoir for the numerous small horizontal fountains along the lower reaches of the river in the neighbouring flooded savannahs, a similar natural cistern was entirely wanting in this locality, where the land on both sides of the river had already for a long distance begun to rise, and all swamps had accordingly disappeared. The source of supply for this interesting water-chute was therefore probably in the near-lying Pacaraima Ranges, the rocky strata of which must be running out to here. The immediate neighbourhood of this natural hydraulic engine possessed an especial charm owing to some blossoming shrubs of the glorious *Kielmeyera angustifolia* Pohl. which, in the construction of its blooms and colouring bears such a striking resemblance to the Oleander. It was a stranger to the place whither it had been probably brought as seed by some bird from the sandstone region, and had found all requirements for its prosperous development. We had hardly passed this spot so full of terror and import to the Indians, than their previous liveliness returned twice as strong: they had not suffered the slightest damage to body or soul.

353. With the exception of the pretty bushes of this *Kielmeyera angustifolia*, the vegetation was miserable and poor: the animal world was no less sparsely represented. Only now and again would the uniform silence be broken by the fluttering of a frightened duck or lonely crane, or our attention directed to the curious flight of the shy pepper-eater (*Rhamphastos toco*), never found on the coast, which appears to choose its home only on the savannahs and in the forest oases. It usually flies in a short broken jerky style, during which the head, probably owing to the preponderating weight of the beak, is bent down. I met with plenty of them tamed by the Indians, but never noticed, as is commonly reported of this family, that in order to swallow their food they must first of all throw it up in the air and catch it. To pick up its food from the ground is certainly a matter of some difficulty for this strangely shaped bird, but it is chiefly under circumstances of domestication that it is obliged to do this, because in its natural state it only eats fruits and berries which it bites off from the tree or bush. Once the food is seized, the bird holds its beak perpendicular, and swallows it, without throwing it up beforehand: it also shows wonderful skill in catching up any food that may be thrown in its way. In the colouring of the bill there is a repetition of the collective play of tints of the plumage, and bare skin about the eyes: unfortunately, this beautiful colouring disappears on the third or fourth day after death, both in the beak and eyes.

354. The paddles danced merrily over and under the smooth water, and the boats quickly sped between the lofty banks which, on account of their many turns, interrupted our view of the Ranges, although they must

have been pretty close by now, when, just after doubling a sharp point, there unrolled itself with every paddle-stroke, an ever increasingly lovely landscape. In a real labyrinth of mountains, wrestling with, and towering over one another, there suddenly spread out before us the picturesque mountain-chain from the base of which the 2 to 300 foot high Piatzang Rock, bare of all vegetation, raised itself and its two giant granite watch-towers: a stone wall some 50 to 60 feet in height, resembling the crumbling masonry of an old feudal castle, had built itself up around it. My first glimpse of this wonderful picture called to mind a hundred memories of the homeland, such as Sachsenburg (Thuringia) with its two old towers, or the narrow Pass where the River Unstrut fights its way to the golden meadows,—which were freshly kindled and revived with every change of situation in our course towards the remarkable crag—for its hoary granite towers became so transformed with each stroke of the paddle that sometimes the ruins just referred to, or the crumbling and cracked tower on the Kyffhäuser,* or again one of the old castles along the Rhine, stood before my enraptured gaze. But alas! where were the welcome slopes with the luscious green of the beech and the oak, and the native vines? Where were the whistling steamers, the innumerable river-boats, and traders, the slowly floating rafts with their little cabins for the crew perched on top which gave Father Rhine such brisk and varied animation? Everything here was enveloped in dead silence, except when momentarily interrupted by the splashing of the paddles and the voices of our Indians.

355. On subsequently climbing Piatzang the height of the upper column was found to be 150, that of the lower 120 feet: the base of the former amounted to 110 ft. On top of the smaller one, a Jabiru had built her nest, and gazed wonderingly down on the rare forms of life that had developed below. According to the astronomical observations Piatzang lies in 4° 11′ lat. N. and 60° 20′ long. W. The Macusis also speak of their piais as Piatzang: the peculiar formation of the towers or else a similarity of these granite columns with the dreaded gentry may have acquired this name for them. A fresh bend of the river exposed another charming aspect: on the eastern shore a little stream, the Wirina, opened into the Cotinga. A third bend brought us to the very foot of the range. On both banks stood a mountain: Morakai on the right, Pataghe on the left, both thus forming a giant gateway to the mountain chain. Innumerable rocky boulders surrounded the bases of both and stirred up anew the waters of the Cotinga. To Morakai and Pataghe are joined a long range of hills, the two of them each forming parallel chains running more or less east and west. As we crossed the mighty portal, the river came to meet us from the N.E., between some 10 to 1,200 foot high mountains with bare tops overstrewn with granite boulders and timbered at their bases, while the waves, hitherto but lightly curled, now became turbulent rebellious billows. Our journey had reached its end. The Cotinga had become a mountain torrent, which was impassable for even the smallest craft. There was nothing else left but at least to look out for a suitable landing place

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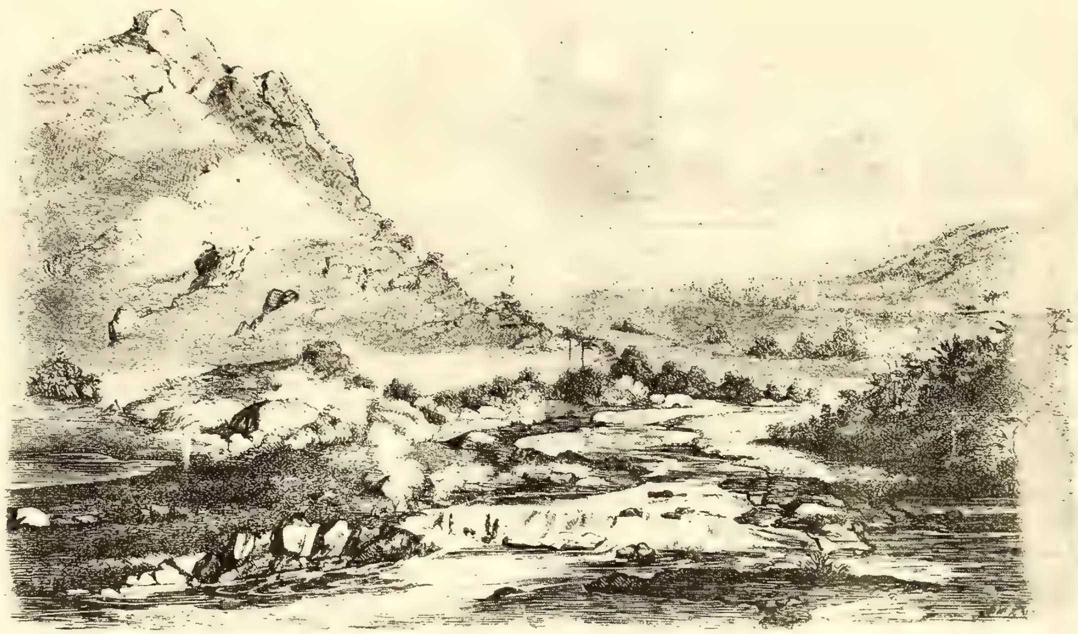
* See Note Sect. 1. Vol. I.



Thal des Flusses [illegible] Vereinigung mit [illegible]

VALLEY OF THE RIVER COTINGA.

which was found on a small stretch below the mouth of the approximately 60 ft. wide stream Waikueh which flowed into the Cotinga from East to North. The settlement Torong-Yauwise (Bird nose) must lie north of our camp: it was there where we consequently had to have our luggage conveyed to make preparation for our journey over the mountains. After emptying the boats we fixed them, until our return, to some of the trees on the bank firmly convinced that they would be quite as safe here as in the London Docks. Certainly no corials of such a size had ever yet been tossed upon the waters of the upper Cotinga.

356. On completing the discharge of the cargo, our attention was directed to a densely packed group of Indians who must just have climbed one of the many huge rocky crags that crossed the valley in a regular jumble, and to whom our deserters, as well as the fishing party we had met, had probably imparted the news of the advance of the Paranagheiris on their settlement. The men had set out to wait for us here, prompted as they were by the knowledge of the river area that we could only manage to come by water as far as this particular spot. In spite of our beckoning and signs that we were visiting them as friends, not a single one dared leave the place of vantage on the rock, and we were therefore forced to despatch Sororeng with the two recently recruited residents from Torong-Yauwise (sect. 348) as peace messengers. These were calmly awaited for by them, and after a short conversation, we saw an old man and three other powerful figures accompany Sororeng on his way back, while the remainder stayed where they were, evidently wanting to satisfy themselves first of all as to the reception given the four attendants of our ambassador. The old man was the head of the village: his treatment by us evidently put confidence into those left behind, for soon the whole crowd started moving in our direction, these being followed by several ugly old women, not hitherto noticed, carrying baskets with cassava bread and calabash bottles.

357. The old chief had an uncommonly worthy appearance, and soon proved himself to be a friendly intelligent man who promised us all possible help. The bread and bottles he made us a present of: the latter contained a drink, looking like lime-wash, that they called Casiri, most disagreeable to our palates, but both were quickly swallowed by our half-starved Indians. Torong-Yauwise lay quite 5 or 6 miles from our landing, and it might be still several days before the baggage could be arranged for loading overland, and we ourselves take our departure. A vacant space some distance from the river at the base of the 1,270 high boulder-strewn Morakai, near the little stream Waikueh offered a pleasant camping ground. While preparing to pitch the tents, a number of black heads furtively and cautiously peeping over and watching us from behind the rocks scattered over the valley, showed that the men and old women had not come alone by themselves. When we went to look for those who were hiding the heads immediately disappeared, only to bob up again behind some covering wall lying further back. Our presence still always seemed to threaten danger to the women, girls and younger folk in general.

358. The eye rested in rapture upon the infinitely beautiful mountain scenery that now lay unfolded on our front. With the eastern slope of Mt. Morakai were intimately associated two equally high mountains

Curatakie and the irregularly cleft Aimutong (White mountain): their mighty quartz rocks, now become visible, were transformed by the sunshine into sparkling reefs of gold whence the sharpest beams of light were cast over the Cotinga valley enclosed by the 1,000 to 1,200 ft. high mountain ridges heading away to the north. Luxuriant, yet still green, meadows which flanked the mountain sides up to their summits and very tips now and again alternated with thick clumps of bush or bleak granite ridges, in the clefts and crevices of which a brushwood had taken growth. When one's gaze strayed from the imposing heights above to the lovely valley of the Cotinga below, it was straightway arrested in the foreground by one of the mighty cataracts which time and again broke out afresh in the far perspective to the accompaniment, on either side, of wildly picturesque crags, and crowded clusters of the glorious Mauritia palm that had raised their heads high above the thriving vegetation on the banks: on the eastern shore several mountains were carpeted with the bright yellow blossoms of the tree-like *Cassia (Baseophyllum) polystachya* Benth., while still further in the distance, the lovely picture included the mountain ridges resting in repose as if wrapped in a blue and diaphanous veil. It was unquestionably one of the loveliest landscapes I had come across in the tropics, one in which the most infinite charm was coupled with rough impressive grandeur. Everywhere Life and Plenty, sufficient to stagger one's imagination, as for instance on the banks of the raging torrents where immense flocks of loudly-shrieking golden-yellow Kessi-kessi parrots (*Psittacus solstitialis*), flying in continuous streams alternately from the forests of the valleys and lower mountain-slopes, had come to settle, only to resume flight after a while with redoubled scream. Almost the whole rocky slope of Curatakie, down which a small mountain stream was working its laborious way to gush out at last with thundering fury, was enveloped with the beautiful *Keilmeyera angustifolia*, the dark red coloured flowers of which imparted an indescribable charm to it: this charm became proportionally varied the nearer the slopes approached the banks of the Cotinga and Waikeuh, for there was soon to be associated with the soft tint of this wealth of bloom, the bright yellow of *Cassia polystachya*, the fusion of all colours of *Coutarea speciosa* Aubl., *Gnaphalium Schomburgkii* C. H. Schultz Bip. and innumerable *Polygalaceae*, *Gentianaceae*, *Convolvulaceae*, *Malvaceae*, *Acanthaceae*, *Melastomaceae* and *Myrtaceae*, all of them forms and types, as unknown as they were unexpected after the previously prevailing poorness of vegetation,—that met my astonished gaze. The giant boulders of the valley were covered with *Cereus*, *Melocactus*, *Agaves*, *Orchids* and small thickets of *Clusiae* and *Myrtaceae*. In spite of the oppressive heat of 100° Fahr. our surroundings continued a fairy Paradise and all the more so because neither mosquitoes nor sandflies dared make an entry.

359. On the 9th October the last load of our belongings was despatched to Torong-Yauwise, where we joined the company of the old chief. After crossing the Waikueh, our road lay over isolated mountains and hills, through welcome valleys, until upon once more arriving at the summit of a hill, we saw in the distant plain a cemetery with numberless monuments spread out at our feet, and on making our way down thought we should be walking over the graves of a past generation; but instead

of tombstones we found nothing but the most extraordinary forms of granite needles and slabs rising, some higher, some lower, above the surface of the ground. It was a pity that Sororeng had hurried off before us and could not interpret the legends which seemed to have attached themselves to this peculiar rocky region and which the old chieftain had, unasked, related to us straight off the reel without stopping, but of which we could unfortunately only understand a few odds and ends. From out of this rocky area so full of myth and wonder, we climbed once more a timbered range of hills up to the other side of which the provision fields of the Torong-Yauwise people extended. The cobs had already been reaped, and the cassava plantation was inconsiderable.

360. On emerging from a small valley we saw on one of the hills crossways ahead of us, the settlement situate between several isolated trees which seemed to be decked with unusually large bright yellow flowers. My hopes of a new botanical discovery were already raised, when I suddenly saw the supposed blooms all on the move and shifting their places —they were tame kessi-kessi parrots that had shifted quarters with a devilish noise on our approach and flown to one of the neighbouring houses. The illusion was extraordinary. Torong-Yauwise consisted of four houses: its residents, some 50 in number, standing together in groups, were expecting us. The men came forward and shook hands: the women and children, shy and timid, held back in the distance, but were unable to refrain from laughing at our appearance as a whole. If we looked ridiculous to them, they must have thought they saw goodness only knows what evil spirits in both our negroes, for these had only to put one foot forward than the whole of the younger folk took to flight, with every sign of a panic, and hid themselves behind the rocks near by.

361. We had already anticipated from our visitors in the camp at Waikueh that fine figures with intelligent and pleasant features might not be quite the general rule at Torong-Yauwise: now that we could see the whole population of the village grouped around us, what we had presumed turned out to be a fact. With the exception of the old chief and a few of the younger men and women, the inhabitants of Torong-Yauwise had the ugliest faces I had ever seen: marked racial similarity stood out prominently in a certain idiotic expression which was only increased by the long black unkempt hair hanging down over the shoulders. For repulsiveness, a middle-aged man took the palm with a facial angle that could hardly have measured 66 degrees in profile: I thought every minute that a monkey was in front of me. The chief's promise to accommodate us in the largest and most durable of the houses was honourably fulfilled: Sororeng had already neatly packed our baggage inside close to the huge heaped-up supplies of maize. According to the old man's assurance, cassava only prospered very slightly on the mountains, and that was why the inhabitants chiefly had recourse to maize which grows so luxuriantly. They bake their bread out of a mixture of *Manihot* and maize-meal: yams, potatoes, many pumpkins and very excellent water-melons constitute the remaining agricultural products.

362. As we became a little more conversant with our immediate surroundings, and every single one of us sought a place to fix his hammock,

we let our eyes wonder in the far distance, where one of the most charming mountain landscapes again presented itself. We found ourselves in the midst of the mountains: everywhere mountain towered over mountain, out of which in the north-west the dome-shaped Zabang, the Olympus of the Macusis, the home of the Great Spirit Makunaima, to which every opportunity was taken to direct our attention, raised itself high above all. To the North and East their contours welted in the blue diaphanous distance with the horizon, while to the South, one's gaze remained fixed on the lovely vale of the Cotinga with Morakai and Pataghe between which one had a peep at Piatzang. From this outlook the resemblance between Piatzang and Kyffhäuser (sect. 354) was so striking that even when the young Macusi who accompanied us to Germany first saw the latter, he came out with a loudly shouted "Piatzang! Piatzang!"

363. Geographically, strictly speaking, the Pacaraima Range can in one sense be regarded as a true Cordillera, because it does not by any manner of means consist of a conterminous uninterruptedly-running mountain chain but rather of an irregular conglomeration of what are for the most part bleak mountains divided from one another by plains and savannahs that vie with one another in the appearance of both their slopes and summits as well as in the fantastic pictures made of their rock-bound shapes, among which, in our own neighbourhood, Yaringra and Warungka-Yeng were prominently distinguishable. The ever active fancy of the Indians had attached some legend to every one of these mountain crests. I will relate the one belonging to Murapa Yeng (Bat Mountain). Long, long years ago there lived an immense bat in this particular mountain that spread fear and fright among the Macusi. As soon as the sun had sunk in the west, the spectral monster would leave its hidden dwelling, hover over the peaceful spot, like an eagle over the home of the young deer, swoop down like an arrow upon anyone to be seen outside the houses, seize him in its powerful claws, carry him to its unknown lurking hole and there devour him. Fear reigned of an evening in the villages and the huts, and lamentation filled the air of a morning when two, yea, often three people were missing: not a night went by without an abduction, the tribe counted fewer members daily, and their complete annihilation seemed close at hand. The piaimen exorcised the spirit—it came back: the men marched out to search for the house of the cursed ruffian—it could not be found; Makunaima was not on their side. To prevent the complete destruction of the race—who is there that does not call Marcus Curtius to mind?—an old woman came forward and declared herself ready to sacrifice her life for the good of her people. As night wore on she took her place with a covered light in the middle of the village, while the other inmates, trembling and quaking, remained in their houses listening for the ominous fluttering of the mighty wings. Seized in its frightful claws the heroine was being carried off the ground and borne away to the chamber of horrors, when she uncovered the fire-stick which, like the sun that casts its rays backwards (comet), produced a long streak of fire in the air, and so let her expectant people know the direction in which the charnel-house of their brethren lay. The tall pillars of fire from the burning nest showed the exact situation, to which the whole population

wended their way next morning guided by the still whirling columns of smoke, and killed the beast. The nest was found on top of a mountain, which is still called Murapa-Yeng, Bat Mountain. The legend is silent as to whether the woman had to pay for the heroic deed with her life: at any rate, there can still be found up there a large heap of bleached human bones. Unfortunately our ignorance of the language was a great drawback to our learning all the legends which they told us of their own accord concerning every striking natural formation.

364. As on previous occasions, so also here in the mountains one settlement quickly carried the news to another that the Paranaghieris had reached Torong-Yauwise. Even next day the hitherto still and silent valleys and plains were alive with gaily-decked figures, who came and settled in the village, while the noisy beating of the drums and the shrill notes of the accompanying fifes were re-echoed a thousandfold. Every fresh procession, as soon as it could be made out on its way in the far distance, enticed us out of the house to see it defiling in front of us on arrival at the village, and to enjoy a sight of the Indians' fantastic feather decorations, their crowns out of which the Arara tail-feathers were waving in the wind, their war-clubs, their bows and arrows. All painted with red and black colours, according to the custom of their tribe,—Macusi, Wapisiana, Pauixana and Arekuna were here—the men and women, old and young, climbed the rising ground with the chieftain, the only man armed, at their head. Immediately following the chief were the musicians making noise with their drums or on flutes carved from the thigh-bones of their slain enemies: then came the other men, one behind the other, and finally the women, panting under the burden of their sucklings and their baskets filled with "trade," the girls and little boys, armed with miniature clubs and bows, closing in the line of march. As soon as they reached the village, the procession stopped, the chief came up to us with hand stretched out in front, offered it to us with the word "Matti," and then instructed his subordinates to do the same, but the women, girls and boys only did it in fear and trembling. This ceremony certainly often proved a nuisance, and it was difficult enough for me, like the others, not to laugh when some such almost naked gentleman dressed in the most heterogenous cast-off garments of the civilised world, strode up to us in the proud conscientiousness of their possession. But it had to be gone through regularly without our daring to pull a long face. A powerful Wapisiana chief had squeezed his nude perspiring body into the worn-out red uniform of a lieutenant of the Colonial militia that had, finally, in course of probably a twelve-month's trade and barter, been passed from hand to hand over a stretch of more than 600 miles. Another was fixed up in a lady's riding habit cut short at the knees, in which goodness only knows some Georgetown beauty may have bewitched the hearts of the dandies on the race-course: at any rate no prouder heart had beaten under it before than did the one there now. Others again were wearing petticoats, or pieces of shirts and coats, with their heads stuck in old hats of which the crowns or brims were wanting, or in caps that had long lost their original colour: and yet not one of these silly fops had the slightest

inkling that his brothers looked infinitely more imposing in their beautiful feather ornaments.

365. As two of the houses were already occupied by our people, there was hardly any room in the two others for the new-comer chieftains, let alone their women: posts were therefore driven into the large vacant spaces between the houses to tie up the hammocks on, and, so as to get protection from the scorching rays of the sun in the day-time, big branches and small thickly-leaved trees were brought from the none too distant forest and stuck in around the hammocks. As soon as a new procession arrived and the salutation ceremony completed, each hurried to the forest and returned to the village with such boughs and branches: it was a case of Birnam Wood marching to Dunsinane, though it was unnecessary to exclaim here with Macbeth:—

> "Arm, arm, and out.
> If this, which he avouches, does appear,
> There is nor flying hence, nor tarrying here."

At night, hundreds of large and small fires that had been lighted, partly for driving away the mosquitoes that had again installed themselves, and partly for cooking the food, spread a really uncanny appearance over the animated and busy camp: one could see hundreds of figures emerging from the dark veil of night and just as quickly disappearing, while in other places again, large groups squatted on their heels around the fires, and the hum of their voices, like the droning of the songs of others, came wafting into our hut like the murmur of a neighbouring stream, until the shrill notes of the flutes or the noisy beating of the drums called Reality home again from the realms of Fancy. Even after a few days the number of strangers had mounted up to 400. Indian hospitality demanded that the head of Torong-Yauwise should furnish the main support during his guests' stay, to do which our honourable old host was often put to his wits' end, while we could sympathise on seeing how the supply of maize piled up in our hut, was daily gradually diminishing: for from morning till night they never extinguished the blazing fires under the certainly 40-to 50-gallon pots in which were being cooked the mush of pounded maize and sliced pumpkin, that early and late formed their meals. Three or four old Indian women with big pot-spoons in the shape of paddles, took turn and turn about in keeping the mess in one continual stir, to prevent its getting burnt, accompanying their labours with a monotonous rumble and mumble: at the same time big people and small would come up and dip their calabash-cups into the bubbling brew and take themselves off into the distance with their share, while others were satisfied with just pressing the bottoms of their cups into the stuff and licking off what sticked to it—it cooled more quickly this way. Equally disgusting was the work of another group of oldish women who were seated around several large vessels which were filled with the thin boiled maize brew that we had already made acquaintance with on the Cotinga. With their hands they were fishing out the corn-grains, not yet quite cooked, lying at the bottoms of the pots, and putting them into their mouths, whence, after being chewed, they were spat back again, the decoction starting fermentation within the next few hours: before this took place, however, the mixture was continually being tasted. The dregs left in the vessels that were then emptied, were usually mixed with cassava meal for bread, which generally spoilt our appetites: but necessity knows no law, and unless we wanted to starve, we had to eat it.

366. In spite of there being five tribes represented here, the most orderly harmony reigned: neither quarrel nor strife interrupted the general rejoicings, and we six Europeans among 400 children of Nature, who had never before seen a white man, felt just as safe as we would have been in one of the cities of the homeland.

367. As the sun neared the horizon, and the high temperature had somewhat cooled, the younger men and boys gathered together and amused themselves with their games and sports. Balls made from maize glumes would be thrown into the air within one of the circles made up of the players and, before touching the ground, had to be hit up again with the flat of the hand by the person in whose direction one of them would be falling, so that the ball would be kept continually on the move. If the ball was missed and fell onto the ground, the clumsiness was punished with the general ridicule of the whole assembly. We were usually to be found in the ranks of the players, but were as regularly the objects for chaff by old and young. When the sun had disappeared, the different dances commenced and all was life and gaiety. The austere and earnest features so peculiar to old age in the American race relaxed as if by magic. The eyes of the older folk, smiling and revelling in the memories of the past, turned to the wonderfully quick movements of the younger, while the fairer sex, who were not allowed to take part in the games, carped at the clumsy ones, and applauded those whose skill deserved it. In the monkey dance, the antics and capers of a troup of apes were so cleverly mimicked, as to make one believe that they were really here in front of him, and kept us in a continual roar of laughter. In the tiger dance, the biggest and stoutest of the young Indians headed the column of animals who, during the course of the dance, in which each one imitated the actions of the creature he represented, had to be fetched out of the ranks either by strength or strategy by two other players representing tigers and carried away by them to a fixed spot. The dance took long to perform until the very last one had been caught by the tiger who would then be cheered as conqueror by everybody. The customary dance corresponded exactly with that of the Waikas: a monotonous song that beat the time, and like the latter had something melancholy and thrilling about it, because here it resounded from several hundred voices. For the most part it was the wonders of Roraima, although this extraordinary mountain lay a hundred miles distant, that were glorified. "Roraima, the red crag wrapped in clouds, the ever-fruitful mother of the streams," or "I sing about the red rocks of Roraima on which dark night reigns even by day," were refrains of the songs that we were to hear so often, especially among the Arekunas in the neighbourhood of the mountain. Quite as often we formed the subject of their poetic effusions, in which they celebrated our appearance, our conduct towards them but especially the route and objects of our expedition so far as they knew them. This art of improvising does not therefore appear limited only to their northern brethren,

but extends all over America. With a trifling modulation of the voice they sing about all their deeds in war and in the chase, and at times give way to an almost inexhaustible flow of sarcastic humour and biting satire to which it would seem Indians are unfortunately inclined. The beginning and end of all their performances always consist of a deafening general outroar, like dogs' barking, by which the spirits who rejoice in others' misfortunes, are driven out of the neighbourhood.

368. Although we spent several days among these happy mountain folk, we could not quite allay the shyness of the women and children, but we already seemed to have found more favour in their eyes than our two negroes, with which their unpleasant odour in addition to their black colour may have had a good deal to do. If either of them unexpectedly turned up in the presence of the women or girls, they would certainly hold their noses, and, as soon as he turned his back on them, spit several times. Young birds twitter just as the old ones sing: when the boys saw the black figures, even at a distance, they also started to spit. The greatest pleasure we could give the men, and the biggest fright the women, was to fire our small mortar, the loud explosion of which would be echoed a thousand times over on the neighbouring mountains. When the women saw us complying with the entreaties of the men, and about to load the gun, we could rest assured that with ears closed and the cry of "Okai Arakabusa, okai Arakabusa (Big Gun)," they would run away and set the whole camp in an uproar. A really laughable confusion took place when we, of a morning, while the women were busy painting their husbands' and sons' toilet required for the performance in the evening, would fire the thunderbolt out of pure devilry. It was a characteristic and stirring life that we led here, and from which some interesting sidelight was daily gleaned: for instance I was deeply moved every time when some newcomers would arrive and this or that one recognise among the Paranaghieri an old friend of his, my brother, and, hurrying up with a hearty handshake, express his unfeigned joy to his friends and relations in the most spirited expressions of speech and action.

369. As on previous similar occasions, I also saw here scars from wounds, that made one's heart ache: they must have got these in battle or else in the chase when at inconveniently close quarters with some beast of prey. Thus, there was a Wapisiana chief who had accompanied my brother for some considerable time on his former journey who had lost the entire calf of his right leg, and whose foot was also a bit askew. The strong powerful fellow, while fishing in the Zuruma some little while previously, had been caught on the leg by a kaiman, but, by not losing his presence of mind, struck the huge brute so soundly on the head and tail with the club that he happened to have at hand, as to make it let go at the expense of his calf, though not before it had bitten the bone through. His companions who had fled in terror at the time, hurried back, quick enough no doubt, to save the unconscious fellow from being drowned. Without any trained assistance, the break and the wound were so far healed as to permit of his making the 4-day trip to Torong-Yauwise, also to see the Paranaghieris. From what we were told, the number of Indian lives lost annually by kaimans must be fairly considerable, for they also

maintained that when once the kaiman has tasted human flesh, it always becomes more daring and savage.

370. The 15th October was not only a holiday for myself and brother, but also for all the Indians by whom it will certainly not be forgotten for a long time to come. It was my King's Birthday, and our gratitude and loyalty could not let it pass without giving expression to our feelings. The day must be a holiday for everyone. All our boxes and cases were therefore examined with the closest scrutiny, and at last to our great joy two bottles of Rhine wine were discovered. With cups filled to the brim and a salute of the guns—the firing of our mortar thrice repeated—I gave the toast of the King, a toast that the mountain echoes repeated times without number over hill and dale, and which again was taken up by hundreds of voices when the assembled Indians were told that it was for the Great Chief of the Paranaghieris. One of the many signal-rockets left behind by the officers on their return to Georgetown for us to fire whenever we liked for the edification and astonishment of the Indians, opened the display under the management of Mr. Fryer who, possessing some pyrotechnic knowledge, prepared the "catherine wheels" and "star-clusters" that were fired to the infinite surprise of the assembled children of Nature amid exclamations of their deepest wonder. So great indeed was their surprise that they even had to play false to that stoicism of theirs which they had ever kept so masterfully under control and give way to their emotions as just mentioned. As might have been expected, no one dreamt of sleep that night: the fiery display, of which they had never seen the like before, drove all thoughts of it away. Frequently enough, in the course of the lively conversation, as well as in between the chattering of those resting further distant, were to be heard the swishing sounds in which the one or other individual was tiring himself out in mimicking the sound of the shooting rocket. Instead of the previous requests for firing the mortar, it was a case now of asking for the fire-rain.

371. As soon as we reached the mountain region, almost all representatives of the higher classes of animals disappeared: even occasionally one would hardly see a single bird of prey circling around in the azure skies. The district made me acquainted with but one animal that aroused my interest, the *Maikang* of the Macusi, the *Carasisi*, or savannah dog of the Colonists. In its general appearance, the Maikang resembles the Guiana Fox, *Canis Azarae,* very closely, but has a shorter brush and more stumpy snout, in which latter respect both as regards shape of the head and situation of the eyes, it is more like a dog, on which account I might regard it as an intermediate link between fox and dog. Mountainous areas interspersed with plenty of wooded savannahs, as well as the lands bordering on the savannah streams where it lives and hunts in regular packs would seem to be the favourite resort of this cunning and clever animal. In the open savannah they seem to stalk their prey rather with the eye than with the nose; in the forest it is exactly the opposite. In these they follow it every time with loud barking. Should a couple manage to steal upon a settlement and sneak into it without being observed, only a few of the parrots and fowls sleeping on the roofs and neighbouring bushes escape them. Such a surprise attack on the fowl

roost, with its accompanying butchery among the same, takes place so noiselessly, that the despoiled owners generally first discover their loss only at break of day. The thieves never tear their prey to pieces where strangled, but always first of all in the forest or some particular lurking hole.

372. The Indians set an especially high value on the Maikang for the reason that the hunting-dogs resulting by crossing it with their own dogs are in great request. The mongrels incline in shape rather to the dog than to the Maikang, are uncommonly slim, always hold their ears up, and surpass every other dog in respect of endurance, and in the rapidity and craft with which they seek out and hunt game. A mongrel like this trained for hunting deer, pekari, or tapir generally costs 10 to 12 pounds sterling in Georgetown.

373. A tamed Maikang is consequently one of the most highly prized possessions of the Indians, but it must be always kept "on the chain" because no amount of breaking in will wean it of its thieving propensities which are liberally indulged on the master's fowls so soon as its owner neglects to tie it up properly. Cooked flesh, fish and fruit, besides ripe plantains are the food that the Indians give it. Belly and breast are a dirty white, the rest of the body on the contrary, except for the ears and snout which are very near black, being dark buff-coloured. If it also does differ from a fox in the bushiness, fulness, and length of tail, it nevertheless possesses the latter's cunning to a marked degree. On our return from Roraima, one was caught that I kept for a long time. From tip of snout to root of tail, it measured 2ft. 2in. while the length of tail amounted to 10¼ in. On account of the price fixed by me for a Maikang dead or alive, the assembled Indians got up big drives almost daily in the lowlands and dales around Torong-Yauwise, during which the grass over the area to be retrieved was each time set on fire. Although this imposing sight had for a long time past lost the charm of novelty, it was always renewed here on account of the wonderful illumination that it spread over the lovely and romantic valleys and mountain-clefts, when the columns of fire rolled themselves in one continual change over hill and mountain, over dale and ravine. On one of these hunts, when all the oases and boulder-rocks were being searched, a tiger-cat (*Felis pardalis*) was disturbed in its lair, and driven by the wildly cheering hunters into the open where, being surrounded, it was soon hit with an arrow that stopped its further progress without fatal injury. In spite of all attempts to defend itself from its captors, they managed to bind its feet and bring it in triumph to the settlement where it was tied to a post with a strong cord when it was relieved of its fateful arrow, and its feet freed from their bonds. The fury of the beast was boundless, now that it was free to move and yet felt itself captive. It was only on the evening of the second day that it first took the food thrown to it, but if anyone approached, its unbridled rage broke out afresh and kept everyone at a respectful distance. As under the circumstances we could not take it with us to Roraima, it had to be cared for here until our return.

374. Among birds, there were only the parrots and red *Araras* (*Psittacus Aracagna*) which now and again visited the rich maize-fields

in large flocks. I had to give credit at least to the latter for the cunning with which they commence and carry out the plundering of such a field. When they come across a ripe one, sentinels are posted round about on the neighbouring trees: the otherwise perpetual noise and screech of their rough notes is hushed: only here and there can one hear a half-smothered gnarring and mumbling sound. If a suspicious object approach the pilfering crowd, the sentinel that first notices it will give a soft note of warning which is answered by the thieves with a somewhat choked croaking to let it know that it has been heard. When the danger is more urgent, the sentinel, shrieking loudly, leaves its post, and with it the whole gang will rise in wild uproar and seek safety in hurried flight. Just as keen as the birds are after the maize-fields, so are the Indians after the birds, not only on account of their tasty flesh, but also for their feather ornaments.

375. The painful experience of a dearth of wild game was amply compensated for by a scaly inhabitant of the Cotinga, the Patha (*Hydrolycus scomberoides* Müll. Trosch.), a very bony fish armed with frightful teeth, that the folk brought us in fair number and of a size that we had never previously seen. Fishing for them cost us plenty of hooks because they bit through plenty. Their extraordinary number in the Cotinga, mined with rocks and boulders shows that a river-bed such as this must be a favourite spot for them.

376. All preparations for making a start on our overland trip being now completed the baggage was made up into 50 to 60 lb. loads on account of the road taking us over steep mountains and along untrodden valleys: the many astronomical and magnetic instruments as well as the quantity of provisions such as maize, yams, etc., necessitated a following of at least a hundred Indians. The same difficulty that presented itself in recruiting our men at Pirara, was renewed here: the requirements of a large number of assembled visitors had been satisfied by the articles we had sold them, and hence there was but little reason for the natives to consent to our proposals. While arranging with them during the evening about the price for accompanying us to Roraima, they told us they could not go, because the way led through the place where the battle, already mentioned (sect. 286), had taken place only a short time before, and as the bodies had not been buried, the sickly stench had driven everything out of the neighbourhood. Our idea therefore was to look up again my brother's old path from Torong-Yauwise. But as so much opposition to this course was shewn by our own men we had to give way to their obstinacy, although on this route we should have met with a number of Arekuna settlements and have never run short of food. For me, the news of the fought-out battle and the as-yet unburied bodies served as a special attraction, because I could now hope to get a collection of skulls and skeletons in my possession. The aversion and supernatural fear of the Indians to even distant contact with the remains of their fellow-creatures proved more powerful than all our wasted remonstrances: yes indeed, for on the very next morning when coming out of our houses, we could hardly recognise the surroundings, because during the night, at least three-quarters of the people had silently and

secretly taken their departure. After endless trouble and a promise to follow their guidance, however great the difficulties to be overcome might be, we managed at last to raise the number of our carriers up to 50, and this of course necessitated our reducing the tightly-packed luggage by one-half, and sending for the remainder perhaps later on.

377. This want of hands also prevented us leaving behind in Torong-Yauwise one of our Georgetown creoles to supervise the things left behind which, as the folk in the place well knew, consisted for the most part of articles for trade and barter: however, trusting with every confidence to the honesty of these so-far unsophisticated primitive people, we placed our property in the custody of the old chief remaining at Torong-Yauwise, in the firm conviction that we would find all our things undisturbed when we got back. Torong-Yauwise where we had spent such happy and interesting days is situate in 4° 16′ lat. N. and 60° 18′ long. W.

CHAPTER VI.

Departure from Torong-Yauwise—Mt. Tamungkang—Valley of the Tapuring—Valley of the Tukere—Appearance of Proteaceae and Ternströmiaceae—Valley of the Muyang—Country of the Arekuna—Yawangra Village—Humirida Ranges—Elisabetha regia—Climbing Humirida—Table-land of Humirida and its vegetation—Watershed of the Orinoco—Mountain valley of the Zuappi—Humeseta Village—Valley of the Kukenam—Mariamaru Falls—Barapang settlement—Rué-imeru—Zuaptipu Range—Wamaratipu and Eramaturu Ranges—River Wararite.

378. After despatching two Indians some days beforehand to warn the inmates of the settlements along which we would be probably passing to bake as much bread as possible, in fact to find the necessary provisions, and setting aside on the evening before the loads that might still be sent for, we left Torong-Yauwise at break of day on 19th October: our caravan consisted of 79 people, inclusive of women and children, under the escort of the chief and his wives who kept us company for the first two days.

379. The way led at the start in a northwesterly direction through a rolling valley, now and again interspersed with small oases and a stunted vegetation, but completely overstrewn with quartz and granite fragments, which made the commencement of the journey all the more troublesome, the sharp corners of the quartz stones even piercing the leather of our shoes. Our friendly host from Torong-Yauwise pointed out a large bee-hive house which he had previously occupied. A thick belt of vegetation, some 1½ hours distant, we took to be the bed of a river: it was the Cotinga, which here came from the N.E. The want of a boat forced us to cross it on foot, but this was only done after much trouble, because of the depth and strength of the current, combined with the round loose pebbles on the unstable bottom, the water coming up to our armpits. The Indians had to cross with the loads on their heads, the women carrying the children on their shoulders. After the last one reached the opposite shore, we made our way in thoroughly drenched clothes along a more northerly track which soon led over a 2 to 300 ft. high mountain covered with huge granite and quartz boulders. In getting over these our clothes were wetted afresh but this time with perspiration. One of the most delightful views with mountain-tops towering on all sides, compensated us liberally for the extra exertion. The giant gate-way of the mountain-chain of Pataghe and Morakai still rose in the south above all the heights surrounding it, but to the W., E. and N. the further distance was closed in with bleak rugged mountains bare of all vegetation. It was only in the valleys that little wooded flats extended to the mountain bases and, in isolated spots, though still only in the narrow passes, clambered to an insignificant height. After spending a monotonous time in crossing the mountain-belt between boulders and stones, we reached its northern slope and descended into a welcome

valley watered by the Airopa, a little stream which made its way through thick clumps of *Mauritia* palm and a luxuriant *Curatella*-bush. The rugged and fantastic mountain tops enclosing the valley again supplied a bounteous harvest for comparisons of all kinds, this being especially the case with Tamungkang that rose on the N.E.

380. Tired and relaxed from the fatiguing and unaccustomed walk, we made up our minds to pitch our tents in the valley and to spend the night here. This was easier said than done, however, owing to the want of the necessary tent-poles. Hardly had we got over our difficulties than an awful thunderstorm, suddenly broke over our heads, almost as if it had really waited until we had finished our work. In the midst of a frightful gale, day was turned into gloomy night, which would now and again be rent by the quivering and blinding lightning while we believed the detonating thunder-claps to be nothing else than the smashing up of the surrounding rocky massifs. Our tents could only offer short opposition to the slashing downpour. After the weather had cleared, there followed a bright starry night which however with its commencing fall of temperature, forced us to resume our journey before daybreak along the valley in a N.W. direction. In the course of the day we crossed the little river Mariko which waters a second long valley and empties into the Tupuring.

381. Next to the innumerable quantity of Mauritia palms our attention was drawn at the exit of the valley to the unusually high ant-hills, of which several measured upwards of 18 to 20 feet, and were constructed in abrupt winding spirals. Remarkable in its way among these insects that did not differ at all from those previously observed, except in its taking place four months later than on the savannah, was when, after depositing their swarms of young, they left their breeding-places in such vast numbers that we were entirely covered with their wings that were so loosely attached as to stick to the slightest touch.

382. A projecting mountain-base prevented us getting a more distant view along the dale, but when we got over it, there lay before us a dense flourishing forest of Mauritia palms which filled the entire valley. Such a forest was all the more surprising as we had hitherto always found and admired the stately tree with its scaly red-coloured fruit only in isolated or at the most, small clumps in the swampy savannah plains: thickly clustered as they were here, the palm lost a very great deal of its imposing appearance, for in such crowded numbers it only formed a dark green roof. Nevertheless wherever we came across them, the eye rested with delight on their beauty. We admired the palms with the same enthusiasm on the mighty delta of the Orinoco and Essequibo, where in many places they likewise spread their fan-like fronds over the surrounding forest-trees, as we did when meeting them on the savannah, over 14,000 square miles in extent inclusive of that classical tract of country believed by Sir Walter Raleigh to be the "El Dorado" through which the tributaries of those three mighty streams, the Amazon, Orinoko and Essequibo work their way. It was with similar delight that we gazed at them again on Roraima at a certain height of 4,000 feet above sea-level, although Martius in his glorious work on the palms states that, at the very most, they are not found at a higher level than 800 feet; we

saw them growing in the swampy areas at the former height in the same surprising perfection as we did on the Rupununi and Rio Branco savannahs.

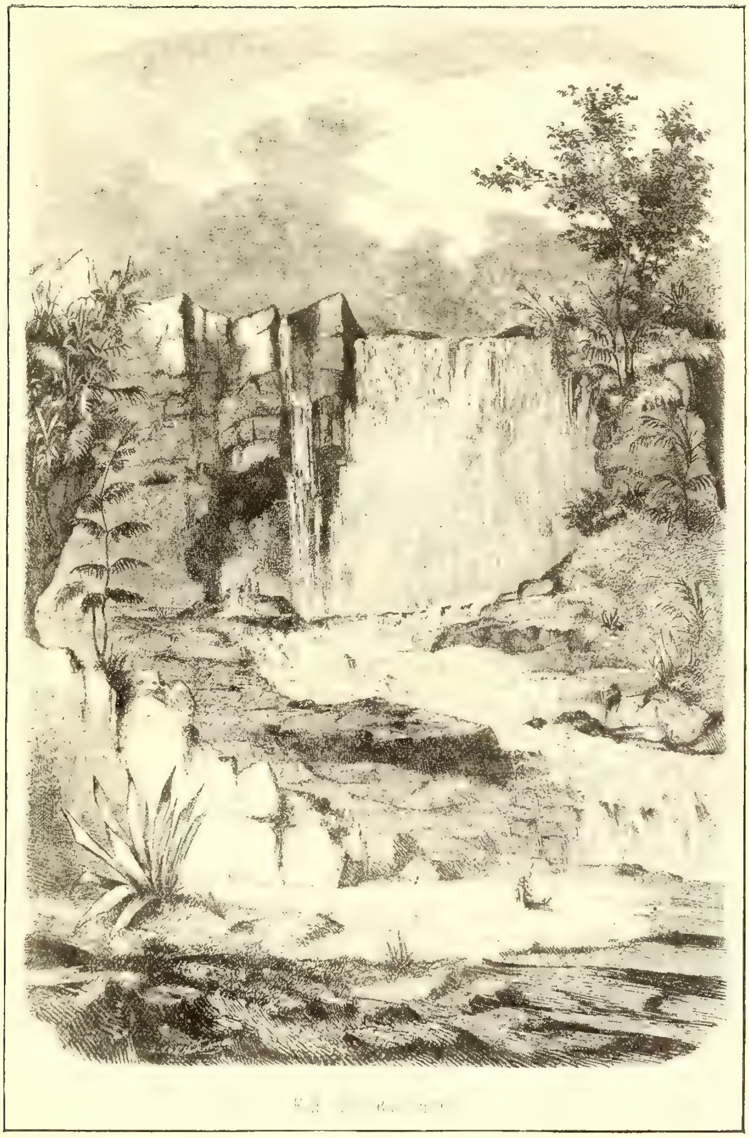
383. The oldest, as well as the latest travellers in South America, *e.g.* Father Gumilla in his "Orinoko Illustrado," Gili in his "Storia Americana," Hartsinck, Aublet and Alexander von Humboldt describe with equal enthusiasm and delight this most glorious of all palms and mention the many qualities and uses to which it is applied by the natives. Were the Guiana Indians to stoop to Idolatry, this palm, which almost supplies their every heart's desire, would undoubtedly prove the object of their worship.

384. The thick forest in this valley which likewise nurtured a stunted *Curatella*-bush, contained *Mauritia* palms 100 to 120 ft. in height. Hardly had we reached it, than a number of axes were put to use: one of our carriers wanted new sandals, while another was dying for the sap which, as I soon noted, contained a considerable amount of sugar material. The enquiries that were instituted in Georgetown in connection with the sap, have yielded far better results in respect to the qualities of the derived sugar than what became apparent in those made with that of *Acer pseudoplatanus* and *saccharinum*: the flow from the fruit-pedicle (*Blüthenstandes*) at all events is the sweetest. A drink is prepared from the sap that can even bear comparison with champagne, for which we of course could not restrain our appetites, especially as the trees were bearing nothing but fruit, when the fluid collects all the quicker in the round little pits cut into the felled trunk: some of this was scooped out with drinking cups and a part drunk straight away as we bent down in front of it. To ensure the speedier flow of the sap, the Indians placed a 6-in. block under the upper end of the trunk and lighted a fire along its whole length.

385. After we had refreshed ourselves sufficiently and replaced the damaged sandals with new ones, we continued following the valley still ever in a more westerly direction until evening when on the slope of Mt. Yawaruima we again found a bee-hive hut which we choose for our night's lodging. It was still apparently new, but unoccupied. Its considerable size, the neatness of its execution, as well as the reasons that could have prompted its occupants to build in such a sterile mountain-desert, aroused our interest and surprise. We had the builder with us: it was again our host from Torong-Yauwise, the owner of still other similar huts in the mountains, a savage gifted with the building instinct and possessing more architectural knowledge than I had ever hitherto found amongst the Indians. We unfortunately did not find at night the rest that we had expected, because from the very first moment that we turned into our hammocks until we got out of them, we were most miserably pestered with a blood-sucking insect of which we sought a specimen in vain. The blood of the skin of the head appears to be its specially favourite dainty. Although we never came to have personal acquaintance with our torment-

ors, we nevertheless experienced their effects in the raised red spots, the size of a pea, that we carried with us for days together.

386. At break of day our old chief left us and, with his wives, returned to Torong-Yauwise, while we continued our way along the valley ever to the North-west and soon crossed the river Tupuring which, running from North to West, and bordered with a thick *Mauritia* forest, poured into the Zuruma. The whole valley appeared to be absolutely full of this glorious palm. The welcome enjoyable hours of the morning when one's body and spirits are fresh and active, when chaff and mirth pass up and down the long train, lasted none too long. The sun rose, joking gradually stopped, the still apparently closed procession widened more and more, and soon a long distance separated the man in front from the one behind. With the conversation lagging, one's thoughts wandered cheerily over the surrounding country until, invited by this or that novelty, they wandered home, and conversation of all description ceased: but even these thoughts came to a standstill when, tired and exhausted, the sun shot its scorching rays upon our heads. And then, without any thoughts at all, one stares into the atmosphere sparkling and quivering with the heat, while the sun's rays, reflected from the bleak mountains, change the valleys into real ovens, one's breathing becoming ever more difficult, and one's spirits apathetic to everything around. This is just what happened to-day, for though not yet mid-day, the thermometer registered 108° F. in the shade. Towards noon we left the enervating atmosphere of the valley and climbed up a mountain slope about 600 feet high, covered with numerous granite fragments. To the N.W. Zabang towered above innumerable mountain-tops, while the long Pawai-irang and Pakara-wari mountain zone stretched away to the north, and the peculiar formation of Mt. Murapa (Sect. 363) as well as that of Anapu-yeng lying somewhat towards the East, aroused our interest that now revived under the less oppressive heat on the mountain-crest. Partly over granite and quartz reefs rising above the ground, and partly over smashed-up fragments heaped one on top of the other, we made our way for a time along the ridge and then descended into the valley of the Tukere which also ran a course to the N.W. The Tukere flows into the Tupuring, and is separated from it by the ridge over which we had just climbed. Between slender *Mauritia* palms and blinding-white masses of quartz we followed the course of the crystal stream, the bed of which was also stored with quartz fragments that here bobbed up above the surface, and there formed picturesque cascades and rapids, until we crossed it and on its western shore stood before a wall-like precipice, whose cooling shade irresistibly invited us to take a rest. To the north some 6 miles distant, there rose the still statelier, pyramidal mass of rock, Amboina. The exclamation "Akui" (snake) and a peculiar movement in the water of the stream let us know that it was just then being crossed by a snake which, judging from its direction, appeared to be choosing our camp for a landing place. But the hasty shouting of the Indians must have warned the crafty reptile of the impending danger, for it turned itself round, and although several Indians jumped in after it, luckily made its escape. Judging from its movements and from its back, which several times rose above



RUE-IMERU FALLS.

the surface, it must have been a Boa of unusual size. With the exception of a few small birds that now and again listlessly hopped through the miserable *Curatella* bushes, a lonely bird of prey now and again soaring high in the skies above, was the first larger animal we had come across since Torong-Yauwise. Even my search for new plants proved to be in vain: the poor vegetation, *Mauritia* palms excepted, was limited to varieties which I had found growing on the mountains apparently in far greater luxuriance.

387. Although when setting out on our expedition the steep declivities seemed to mock all attempts at being climbed, we were nevertheless assured by our guide that the sharply precipitous mountain ridge could be crossed. After long fruitless search we at last found a spot for making the ascent, and upon reaching the crest followed it in a north-westerly direction. We had already had sufficient experience of tracts and areas conspicuous for their wildly irregular fragmentary masses for some days past, but such an extravagant chaos as we met with here had never hitherto presented itself. The Indians had some special name for, or some special legend about, every peculiarly shaped rock, of which many measured several hundred cubic feet. One of these formations was particularly curious. Upon the gradually rounded-off extremity of a 16-ft. recently formed block of granite rising perpendicularly from off the ground, lay a more oval piece, this again being topped with a smaller and rounder piece of rock. If these stones could have been placed one on top of the other by human agency, we should have had to believe it. The whole structure rose more than 20 feet above the real mountain summit. Wherever the eye turned from this height, it struck the most extraordinary and grotesque rocky ridges, heights and reefs. Besides those already recognised and mentioned, particularly in the N.N.W. were both the tops of Pirocaima and Camana which again confronted us in quite singular shapes. In almost every defile of the ridge there rushed over the precipice a merrily dancing torrent to bury itself in the main current below. On the sides of one of these streams that we waded during the afternoon, we again met with groups of shrubs on the stony banks, a sight that had become so rare in the district otherwise so poor in vegetation through which we had been making our way since yesterday. Our joy was increased by the kinds of flowers covering the bushes that I had never before seen. They belonged to the family of *Proteaceae* and *Ternströmiaceae* and were the first representatives of the very interesting genera *Rhopala* and *Ternströmia*. The vanilla-like scent of the *Rhopala complicata* Humb. Bonp. which, as I had opportunity of remarking later on, is peculiar to almost all the species of this remarkable group, was almost overwhelming. The height above sea-level at which I found these plants, was 12 to 1,600 feet and although I also discovered the *Rhopala nitida* Rudge subsequently in the neighbourhood of Pirara, it was nevertheless always met with only on stony conglomerate hills and on the slopes of rolling downs on the savannahs in between *Curatella* trees. Both species, *R. nitida* and *R. complicata* are only found here and there in the savannahs, not in the oases or banks of the streams. The *Ternströmia* also yielded a new species, the *T. rubicunda* Klotzsch. Small trees of a

Humiriacea, and shrubs of the peculiar sweetsmelling *Antonia pilosa* Hook. alternated with the above plants and formed a glorious border along the river bank. A wooded oasis through which one of these mountain streams ran its course, tempted us to camp the night—temptation to which I gladly yielded all the more as several new forms unexpectedly presented themselves amongst the growth along its extensive edge. It was here that I saw the *Hyptis membranacea* Benth., with its delicate light-blue edged petals and its green calyx which, according as they are struck by the light, become changed from green through white to a pale red. The leaves of this lovely tree, the height of which varies from 30 to 40 feet had a strong aromatic scent. Its wood is unusually hard, and its bark also. Without doubt it is the biggest tree-like species of the family *Labiatae* that is found in Guiana. Mr. Gardner, the well known English botanist and traveller, found this *Labiata* within the diamond areas in the Province of Minas Geraes in the neighbourhood of Cidado do Serro as one of the commonest trees: it consequently appears to be distributed over a large portion of South America, but only at a certain height above sea level. I also found upon the banks of this stream yet another new species of *Swartzia* and *Rhopala, S. capparoides* Klotzsch and *R. suaveolens* Klotzsch; the latter however only appeared as a tall slender tree, its blooms filling the air with their strong vanilla scent.

388. On returning to camp from my botanical inspection I was at a loss to understand at first the depressed and gloomy looks of our carriers: as a matter of fact, the stores were as good as gone and the rations that had already been reduced yesterday by one-half, had still to be further diminished, so that very little remained for next morning, when we had to reach an Arekuna settlement. The night was fairly cool, the thermometer at 6 o'clock indicating but 77° Fahr.

389. At sunrise we continued our journey over the short yellowish grass all wet with dew and in between quartz and granite boulders. The summit of Pirocaima lay now some 2 to 3 miles north of us. A poor sort of vegetation reached up to about a quarter of its height: we only saw bleak rock above that. The sensitive cold made us step out more briskly: the sight of an extensive valley that spread itself out below arrested our steps on the slope of the ridge. Was it a morbid dream or was it magic that had transformed this stony desert into a lovely paradise? A slow and equably heaving sea of clouds still rested on the valley depths: some of the luxuriant tree-tops and low rises were nestling in the nebulous bed while others, already freed from its envious covering, emerged like islands above its white and woolly surface. Every view gave us fresh cause for surprise. Instead of the hitherto steep, pointed and cleft summits and peaks, there arose from N.E. to W. high above the sea of clouds, and seeming to enclose the magic vale, a table-topped mountain chain, upon which was set a 3 to 400 ft. high perpendicular crest or stone wall capped by a huge flat stratum of earth—it was the sandstone mountain Humirida. Speechless with delight we gazed down at that lovely undulating valley and over the cloudy sea, every moment becoming clearer, out of which the still lovelier verdure shone forth in the most varying plays of colour. We could see immense flats all fresh

and green, with yellow streaks pushing their way in between, that very forcibly recalled to my own and brother's memory the golden meadows of the homeland in their spring clothes. The richly blossomed *Cassia polystachya* had developed here into a flourishing forest tree, and had in some places crowded out the other ones. To the W. and S.W. the enraptured gaze was arrested by Mounts Warungkaieng and Ariwaiyang until the horizon in the blue distance closed in the Sarauraycng ranges. Finally, the last of the flowery decking disappeared, and like silvery bands the Muyang and its tributaries meandered through the wanton abundance, to pour its waters into the Zuruma.

390. After glancing back once more upon the forces of nature broken out in wild revolt, we made our way down to the valley,—which we only reached after a tiresome struggle with the quartz and granite boulders rendered moist and slippery by the dew,—where we imagined ourselves no longer within the Ranges but in one of the most luxuriant spots on the coastline. We turned to the West. We entered a woody oasis, through which a small tributary of the Muyang had spun its way, that was formed of giant forest timbers, proud palms, flourishing *Heliconiae* and Ferns. As we crossed it we turned to the S.W. and up towards a wavy stretch of rising ground where a landslip about 20 feet deep, choked with uprooted trees in heaps of confusion, barred our further progress. We doubled round this wide space and thereupon reached the elevation, from which we saw several Indians who we were told were Arekunas standing upon one of the outlying spurs of the Poaghepping. As soon as they noticed us approaching, they left the rise and hurried down the slope. After turning more towards the north we descended a ravine of the Poaghepping down into the valley again, where ahead of us, upon a pleasant and attractive flat was situate a large house, the longed-for Arekuna settlement Yawangra. We had set foot in the country of the Arekunas, a tribe which, as it appeared, formerly occupied the basin of the Uaupes, and whom Monteiro and Ribeiro describe as cannibals. They now own the mountain-ranges and savannahs of the sources of the Caroni, Cuyuni, and Mazaruni, and are one of the most populous tribes of Guiana: about 500 souls live in the British area. Before reaching the house, in front of which a crowd of red figures took up their position, we had still to wade another tributary of the Muyang.

391. That the residents had expected us to-day, was to be concluded both by the sentries that had been posted as well as by the careful toilette. The whole of the body with the exception of the hair was coloured red with arnatto, the face on the contrary with stripes and spots of Caraveru, a name given by almost all the Guiana tribes to the colour obtained from the *Bignonia chica*. We were given a friendly and hearty reception by the almost blind chief in a long pathetic speech, of which our interpreter only told us so much that we could obtain neither bread nor meat, but at most, a few plantains, yams, and some sugar-cane.

392. The facial expression of the Arekunas had something much more martial than that of the Macusis: their figure was stronger, more robust, if also not larger: the colour of the skin was the darkest I had yet seen. Three-inch-long pieces of bambu, painted and incised with artistic patterns of all kinds, were worn through the nasal septum: similar

ornaments were to be seen in the pierced ears: several also wore them in the bored under-lip: with some, the sticks in the ears were replaced by little birds' heads. The neck was decorated with strings of pekari tusks, or monkeys' canines, from which long threads with tufts of birds' skins or roughly-stuffed squirrel skins hung down the back. The waist-belt was made of human hair. We got to see really little or nothing of the women and girls, as they did not come out from hiding, but watched us from a respectful distance. They also had the whole body painted with arnatto: their necklaces were strung with laba's incisors, or monkeys' canines: they were strongly tattooed from the corners of the mouth to the ears. They wore their long black hair carefully plaited and done up at the nape of the neck in a knob. This was the toilette of the otherwise well-proportioned female figures. The settlement consisted of 23 people of whom the greatest number suffered from bad eye-disease: two of the occupants were quite blind, and the chief not far from it. The blind ones at least wanted to feel us, and for that purpose were led to us to squeeze our hands: their eyes were less inflamed but on the other hand covered with a thick white film.* These symptoms of disease surprised us all the more, as we had never found them so generally present since we left the Warraus.

393. The language of the Arekunas appears to differ only dialectically from the Macusis.

394. Our two Indians who had hastened ahead (sect. 378) had already left again in the morning, and had placed in front of the house the provisions—a bundle of plantains, a couple of baskets with yams and some sugar-cane—that could be spared by the residents. The assurance of the old chief that in all the settlements to be visited on our way to Roraima, we would find just as little as at his place, disheartened us more than the vanished hope of a hearty meal to-day. As a result of the family feud already mentioned (sect. 376) a large number of the Arekunas had betaken themselves farther westwards: the provision-fields however had been partly destroyed by the victors, and owing to the war had remained partly uncultivated. We had up till now seen just as little game in the attractive valley as on the rocky heights, and the finger-long fish in the streams, mostly belonging to the genus *Hypostoma* would have to be caught in their thousands to satisfy the more than 70 hungry mouths. Vegetables remained our only consolation.

395. Under these depressing circumstances our stay could only be of short duration and after willingly accepting the offer of two young men to accompany us to Roraima, although this meant two more mouths to fill, and after two old women had summoned up sufficient courage to bring us three cassava cakes, some roasted maize, and several calabashes of casiri, which latter we gladly handed over to our Indians, we left Yawangra settlement more downhearted than when we reached it. In the course of a few hours we were to meet another settlement, where however we should find just as little food.

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* The thick white film over the eye refers to corneal opacity, the result of past septic inflammation and ulceration of the cornea (ulcerative Keratitis.) (F.G.R.)

396. Following the westerly course of the Muyang valley, in which the river has its source, we soon came upon a thick oasis, and then emerged again on open savannah. The sandstone range of the Humirida formed at a distance of 5 miles the northerly borders of the valley. The green plains, now and then interrupted by bright yellow bands of flowering *Cassia polystachya*, spread themselves thickly halfway up the mountain where they tapered off in the defiles into small streaks as far as the perpendicular sandstone wall. One of the most voluminous oases that we crossed consisted only of Palms and *Musaceae*, of which the latter, especially on account of the colour-enamel of their large flower-sheaths, spread a lovely fusion of tints over the dark green foliage. Among the former, and particularly noticeable owing to their extraordinary flourishing growth and frond-formation were the *Iriartea exorrhiza* and *I. ventricosa*, *Martinezia caryotaefolia* Humb. Bonp., and several species of the dainty *Geonoma*. *Ravenala* and *Phenacospermum* appeared in the same perfection that had only been previously noticed in the valleys of the Tuarutu and Ossotschuni Ranges. Ferns, particularly those belonging to the genera *Adiantum*, *Schizaea*, *Aneimia*, *Mertensia*, *Hymenophyllum*, *Polypodium* and *Acrostichum*, decked the ground and venerable trunks of the foliage trees. The ground shewed the same formation as the valleys of the Tuarutu and Ossotschuni Ranges,—a stiff clayey soil, mixed with sand.

397. After travelling uphill in the luxuriant oasis for a long time, the path led into a deep ravine down which, with echoing din, a small stream was excitedly bouncing in its hurry to join the Muyang. After long search we at last found a shallow spot enabling us to get across, refreshed ourselves with the clear cool water that was bordered by a thick bank of *Trichomanes* sp., and then climbed the height on the other side where, after a long walk in the forest, we reached an open rolling savannah which, with a gentle incline, sloped down-hill. West of us upon a small rising ground stood the houses that we had been told of, and to which we traced our steps. South of the village Mt. Ariwaiyang rose above the thick forest. Not a human being was to be seen, and we already thought they were unoccupied when, upon entering the settlement, we saw a young man standing in front of one of the houses who greeted us with a long pathetic harangue, which commenced with "Hure Macusi (I am a Macusi)." I had never before listened to such oratorical talent, to such a flow of language: even in the assemblies of the ancients I could pick out no one to contest his right to the bay-leaf of eloquence. With the most flowery embellishments of speech he told us approximately that what we wanted *e.g.*, cassava bread, etc., he had not got, that he himself required maize, and that together with his family he had to feed on the forest fruits and could only drink water, like animals. His house where we could sling our hammocks, the neighbouring stream Muyang, from which we could draw water, was the one and all that he could offer us. He also sincerely trusted that we, on our journey to Roraima, as well as my brother from thence to the Cuyuni and Georgetown, and also the remaining Paranaghieris on their return to Pirara, might never find another settlement where less should be offered us than what lay in his

power to give. Our Indians who had gone on in advance had informed him of our plans the purport of which he knew how to work up and take exquisite advantage of in the most picturesque and daring similes until, at the end of quite half an hour, he closed his address and shook hands with us. The statement that the South American Indians do not possess the gift of oratory I have certainly not found confirmed in the very least among the Guiana tribes. On the other hand I have listened at their gatherings to many speeches that not only as regards the keen, most surprising and striking imaginative comparisons, but also the healthiness of mind that constituted their nucleus, were far superior to the very large majority of those of our German extempore speakers: and yet their subject matter had to be imparted to me through a third person. Through the open door of the house, before which this Indian Chrysostom had received us, we saw assembled the remaining villagers who, on completion of the harangue, also came out and gave us greeting: the greater number of the men were away travelling. There was no trace of any other food to be seen than some heaps of palm-fruits. Our stay was consequently just as short here as at Yawangra and particularly so because we had been assured by our host in the course of his speech that we might reach before sundown another settlement the occupants of which had reaped a big harvest of maize. Without being asked, Chrysostom attached himself with wife and children to our party: his step-father, an Arekuna, with whom he had settled down, remained behind.

398. However trying the continuation of our journey proved to our tired feet, they nevertheless had to submit to it: the demands of hunger were too strong. Silent and sullen, we proceeded towards the North West over a number of tributaries of the Muyang, through wooded oases and over green savannah plains. In the former our noses were repeatedly worried to-day by a strong onion-like smell: from what the Indians said, this came from a creeper, but botanically it was not known to us. (Sect. 1,009.) Judging from the commonly noted musk-odour which our companions referred to a snake that crossed the path, this oasis must apparently be full of snakes.

399. It was a long while since our ranks had been as broken as they proved to-day. We were making our way to the rallying point, like a scattered army. It being the guides' business to bar the wrong path at every cross-road with broken-off twigs so that we Europeans as well as the Pirara and Torong-Yauwise residents who were straggling still farther behind might be jointly and severally warned from going astray, we were all the more surprised to find, on coming to the first of such double-paths, that this precaution had been neglected. Where to go now? We received no answer to our shouting: we searched for tracks in vain, and in good faith that we were on the right pad, we crept forward, and after a long time followed it into a field with cassava not yet matured. We had tired our feet for an hour to no purpose and now had to retrace our steps. Before reaching its starting-point the forest resounded with the shrill shouting of the careless leaders who, on emerging into the open and seeing no one following now for the first time realised their negligence and were hurrying back to look for us.

400. At close of day we found ourselves in the neighbourhood of the western spur of the Humirida Range the wall of which, gilded by the sun, had increased considerably in height, and heartily welcomed the longed-for house. Our looks must have expressed our wishes pretty clearly for hardly were the words out of our mouths than we were assured that nothing but maize and a few plantains were obtainable. They had already roasted the former for us: but a large quantity was being preserved for kasiri.

401. To-day's and yesterday's march on empty stomachs had tired us so much as to need some rest which we proposed taking on the morrow, Sunday. A pleasant spot immediately at the foot of the Humirida and on the edge of a picturesque torrent, which was rushing down the sloped surface of the Range, offered us a comfortable camp. According to the astronomical observations which it was possible to take at night, we were in 4° 30′ lat. N. which made us now 106 miles distant from Pirara.

402. Since leaving Torong-Yauwise, the clouds would almost regularly break into a wild thunderstorm at sundown which was generally followed by a clear starry night. The same phenomenon happened to-day and changed our neighbourly torrent within a short period into a madly raging flood which resumed its own peculiar character just as quickly as it had lost it.

403. At break of day everybody with gun, bow, and arrow, hurried off into the oasis, on to the savannah and up the mountain, in order to grace the Sunday's table with something better than roasted maize-corn. In company with some boys from the Torong-Yauwise settlement who as the result of a few little presents were quite willing to come, I climbed the mountain side: I did not want to prevent any of the adults from going hunting. My hopes for a rich botanical harvest were not disappointed, the sweat caused by the climb over the innumerable sandstone masses rising above the level of the ground, being amply rewarded. I found a nice *Epidendrum* with rose and white spotted flowers, hitherto unknown to me, giant *Tillandsiae* and *Cactus*, but a much greater joy was soon to be my lot. I must have climbed about 500 feet above the savannah on to the edge of the forest that extended to halfway up the mountain side when I recognised rising out of it the gigantic slender trunk of the *Elisabetha regia* Schomb., its crown overladen with blossoms, which my brother discovered on his first journey. There can be no dispute that this tree is one of the greatest ornaments of the tropics, and forms the loveliest representative of the *Amherstieae*, the connecting link between *Brownea*, the Rose of Guiana, and *Desfontaines heterostemon*: my brother found the second species *Elisabetha coccinea* on the same trip.

404. Along with my companions I soon pressed a way through the bushes towards the tree, but saw that it could not be climbed by me, nor even by one of my copper-coloured boys, little Matziki (Tiger-cat), so called on account of his climbing powers, who, after looking wistfully at the knife offered him for some flower-stalks, and then critically surveying the height, shook his head and gave it up. It was the first

and last occasion on which I saw the plant. Near the trunk, under cover of luxuriant ferns, particularly species of *Trichomanes, Polypodium,* and swollen mosses, a chattering rivulet was gurgling, skipping and splashing on its way to the plain below. It was upon its banks that I got hold of a prettily marked toad, probably a variety of *Dendrobates tinctorious* Wagl.: the dull black ground-colour of the head, back and feet was broken by a number of irregular yellow streaks.

405. After my return to camp, the huntsmen came in one after the other, all in low spirits and still with empty hands. A few pepper-eaters which I at first took for *Rhamphastos vitellinus* formed the only bag, but the peculiar colour of the beak, that fairly resembled *Rhamphastos erythrorhynchus*, shewed it to be *Rhamphastos discolorus* Linn., Jardin et Selby.

406. The sandstone range had to be climbed next day: the cool morning might well be devoted to it. As his wife had to make arrangements for her approaching confinement, we prevailed on Sororeng to leave her here until we got back, a proposition to which, after long hesitation, he agreed.

407. Earliest sunrise on the 24th October found our column, increased by some additions from the settlement, already on the quick march following the course of the valley which was still always sloping to the westward. After travelling along the foot of the Humirida, and crossing a small affluent of the Muyang, we arrived at the spot indicated as the starting point from where we had to clamber over the Range.

408. However inconceivable the ascent of the perpendicular sandstone wall of Humirida appeared to be, some of our guides who had already travelled the road a few times, nevertheless assured us that, though perhaps a bit difficult, it was possible. The Range, free of all trees from base to summit, plentifully cleft at the sides, and only here and there covered with low bush, shewed the most luxuriant forests more to the westward, where it rose to a height of more than 2,000 feet above the plain. We set out upon the dangerous enterprise. Between and over colossal sandstone rocks, up went the trail: at the end of an hour we had not reached half-way although our strength was exhausted: the panting breast, the trembling knee that every few minutes required a moment's rest, and the scorching sun, from which we were quite unprotected, exhausted the remainder of our strength. We were really in a bad way, and yet we Europeans held nothing but a stick in our hands, while the Indians, steeped in perspiration and carrying their load by means of a broad band over the forehead, clambered over the masses of stone with as much ease and agility as if these were level ground and the glowing orb a cooling shade. Our long procession glided like a snake up the mountain side and the outlook, front and back, was of so strange a nature that it was even able to captivate us, exhausted as we were, on the repeated occasions that we were forced to rest. After many an hour's climb we reached the 500 foot high sandstone wall. For us to commence its ascent at once along the dangerous trail that the Indians had been forced to use was a matter of impossibility: our lost strength had at least to be partly recuperated. A quantity of moss and lichens

put a little life into the gloomy fabric: its cracks and crevices were filled with several orchids, *e.g.*, *Epidendrum*, and a small shrub belonging to the *Piperaceae*, the roots of which had entangled the rocks in a regular network: it was by its help that we would have to climb the ravines hewn out of the main massif. The possibility of the climb was indeed dependent upon this same network, but this again required above everything else intrepid courage, the complete and free use of the hands, and the close investigation of the stability of the roots and projecting stones in the weathered and decayed sandstone wall, before one could trust the weight of one's body to them. A slip of the foot before the hand could steady itself at the halt that this growth or that chink offered, the loss of one's balance, or the breaking of a root, not only meant a most horrible smash for the unfortunate fellow himself, but the probable death of a large number of his followers. A start was made on the daring enterprise. We Europeans followed immediately next to the guides. The procession clambered zig-zag, one following the other at a fixed distance and swinging from step to landing up the wall. I got a shudder the first time I looked below: the brown figures were climbing up the rocks like ants, and the thought that with the bursting of a forehead band, the load might loose its sole and only support, and in falling knock over one of the men following, made me shut my eyes, and not dare look behind again. No noise interrupted the dead silence which was only now and then broken by the plunge of a stone that had crumbled its way loose. With the arrival at the top of the men ahead of me, I also threw myself quite out of breath on the more secure flat and took another peep down the steep wall, but had to close my eyes and hasten away, because every moment I imagined I should be hearing the death-cry of someone who had fallen over. As each of the climbers reached the ridge he uttered a loud shout of triumph like the ones before him. In the course of three hours the last of the party finally reached the top, and now for the first time the anxious breast could breathe with freedom and one could appreciate in dumb delight the beautiful panorama which stretched beneath and near him in its absolutely infinite wealth of charm. Upon our entrance to the valley of the Muyang we had rejoiced from the very bottom of our hearts over the wonderful landscape—the same thing here, and yet again another one opposite. Shall I describe it as more beautiful? I don't know. The magic of the moment excluded comparisons. In the solemn stillness of virgin nature, the valley of the Muyang, strewn over with many a luxuriant oasis, stretched itself before us at our feet, but the eye sought in vain the roof of the house that we had left a few hours before: the work of man had been buried in the wantonness of Nature. Not a sign of active life, no noise of busy human hands disturbed the deep solemn calm in which Nature looked proudly up towards us, and held us spell-bound. Toward the S.E. and W. innumerable mountain chains melted away into the surface of a green wavy sea: only in the S.E. and in the far W. did the gloomy bleak rock masses of Mairari and in the S.W. the peculiar steeple-like Mareppa-Emba—the latter with a height of 3,500 feet—rise above this sea of vegetation, over which somewhat further to the W. the Erimitipu, and in W. by S. the

Ucaraima Range soared to a height of 3,690 feet. The rocky wall was by no means the summit of Humirida, which we had still to climb before we could sweep our gaze freely towards the North.

409. It seemed as if the pure current of air blowing cool around us, brought new strength with it, so wonderfully quickly did we feel refreshed for the continuation of the journey. Between the fissures of the sandstone layers there sprouted several orchids, namely the former species of *Epidendrum* and a beautiful *Odontoglossum*, with which a little orchid set with sedge-like leaves was associated, but unfortunately no longer in bloom. Besides these orchids, the *Marcetia taxifolia* DeC., decked with rose blossoms, had chosen the crevices and clefts for its place of stay: this plant, that was seen here for the first time, I had taken for an *Erica* in the distance. As we reached the real mountain top, a broad and glorious highland interrupted by insignificant hills and refreshing green clumps of woodland and bush, lay before us in the N.W., N., and N.E., until the high mountain ranges again limited the far horizon. We followed a course now straight for the North, until a thick cluster of arboreal growths attracted my attention from the mountains. It was composed of extraordinary ferns. Their bare stems, several feet in circumference, soon branched dichotomously, these branches tapering off at their extremities into long grass-like broad leaves. The absence of blooms and fruits left it doubtful whether these curious plants were to be referred to *Pandaneae* or to *Vellozieae*. Between small sandstone boulders which were overrun with *Eriocaulon* and a peculiar greyish-black grass, these wonderful shapes were sharply defined against the clear atmosphere. During his ascent of this sandstone range in 1838 my brother had discovered a group of these curious plants, which likewise then happened to be without fruit or flower. His lively wish to identify these peculiar growths with their blossoms was soon to be fulfilled. We were thus mutually exchanging ideas as to what these plants could really be when on reaching the slope, the most delicious scent was wafted over to us on the light north wind and our eyes remained fixed in wonder upon innumerable stalks studded with white, violet, and purple-red flowers, that rose high above the surrounding bush. They were clumps of the beautiful *Sobralia* among which the *Sobralia Elisabethae* Schomb. excelled all others: I found flower stalks 5 to 6 ft. long. Not only the *Sobraliae*, but also the shrubs and smaller trees which, owing to the thick dew, were still trickling with moisture, were all unknown to me. Every bush, every shrub, every tree, was new: if not the family, well, certainly the species was. I stood now on the borders of a plant zone still foreign to me which, as if called up by magic, unexpectedly unfolded itself in unfamiliar and wonderful forms. I was seized with similar astonishment, similar surprise, and similar feelings as those to which I succumbed when first landing on the South American continent, except that I believed myself no longer transported there, but to some fresh portion of the globe between the *Proteaceae* of Africa, Sumatra, Java, etc., and the *Melaleucas* of East India and Australia. The leather-like stiff leaves, the repeatedly tortuous branches, the extraordinary large shapes of flower never hitherto noted, their glaring colour, all, everything

differed essentially from the characteristic vegetation with which I had already become so intimate. I knew not where first to turn my eyes, whether to the waxy blooms, sparkling with their crystalline dripping dew-drops, of the *Thibaudia, Bejaria* and *Archytaea,* or to the large camelia-like white flowers of a *Bonnetia*, or whether I should let them rest upon the bushes, interspersed with thousands of blossoms, of *Melastoma, Abolboda, Vochysia, Ternströmia, Andromeda, Clusia, Kielmeyera,* or upon the strangely organised flowers of the *Sobralia, Onchidia, Cattleya, Odontoglossum* and *Epidendrum,* which covered the damp sandstone blocks—and what an infinitely large number had already bloomed, or were still awaiting development! It would almost seem as if Flora had wished to offer this surfeit of bounteous bloom as compensation for the extraordinarily oppressive deficiency of all animal life, for everything was silent, enveloped in profound rest, even the quizzing humming-birds and *Nectarines* having disappeared: the wonderful impression was accordingly all the more forceful and surprising! But my joy rose even to a higher pitch as I stood in front of the first representatives of the *Cinchoneae,* of which I found not only the *Ladenbergia densiflora* Klotzsch, *Cosmibuena triflora* Klotzsch, and *Ladenbergia (Buena) Roraima* Klotzsch, but discovered a new species, *Ladenbergia (Cascarilla) Schomburgkii* Klotzsch. Every step brought something new. Between lovely bush the way led down the slope to a little stream, until, at the bottom of the valley we crossed the river Zuappi which flows to the North East from here into the Cotinga. With the new plant region we had at the same time entered a new water-shed, that of the Orinoco, divided off from the Amazon basin by the steep wall: because to the west of us all the streams flowed, like the Yawaira, northwards to the Orinoco. The Zuappi babbled and hummed through the mighty sandstone blocks and massive boulders of its bed while on both sides the sandstone strata had formed themselves into layers which in one place were covered with a coating of earth half or quite a foot thick, and in another again remained bleak and exposed, to be overspread with the peculiar white lichens, *Cladonia rangiferina* Rich. Willd., *C. coccinea* Hampe, *C. cocomia* Hampe, and *C. carnea* Hampe, with their red fruit cups (*Scutellae*). The lichens formed a striking contrast with the luscious green of the earth-covered terraces upon which there flourished *Echites angustifolia* Benth., *Macairea multinervia* Benth., and *M. parvifolia* Benth., as well as luxuriant shrubs of *Bonnetia sessilis* Benth., *Vaccinium puberulum* Klotzsch., *Bejaria grandiflora* Humb. Bonp., and nice trees of the glorious *Archytaea multiflora* Benth.

410. Where the scorching rays of the sun had not evaporated the dew, the lichens showed themselves quite spongy and swollen, while in other situations removed from them they were quite stiff and crumbled to pieces under our feet. We partook of our meagre breakfast close by an abandoned house, refreshed ourselves in the cool waters of the Zuappi, and after packing up my botanical treasures proceeded on our way through the magic garden when a forest, with its edges bordered with gigantic 20 to 30 ft. high *Cactus* columns soon received us. Innumerable palms raised their proud crowns of fronds above the mighty foliage trees,

the extensive boughs of which were almost completely covered with the dependent *Cereus* as well as with a motley intricacy of immense *Tillandsiae*, Orchids, and Ferns, while countless creepers and rope-vines, from the thickness of an arm to that of a human body, running up their trunks like ropes in odd sorts of twists and tangles, wound themselves from branch to branch whence they either ran straight down or hung in rings and loops and changed the forest into a fairy grove. The further we went, the richer and more varied became the vegetation. An impression only just received would be dispelled a minute later, but my delighted astonishment reached its climax when out of a confusion of grasses with tree-like blades, *Zingiberaceae*, and *Musaceae*, I happened to come upon the first clusters of tree-fern, the fairy-like *Cyathea* and *Alsophila*. No plant had so far awakened such a peculiar sensation, or aroused such deep enthusiasm in me: no, not even the sight of the first palms, not even the vegetation with its anomalous forms of flower and infinite charm of colour, that I had so unexpectedly lighted upon this day. From the 18 to 20 ft. high trunk, its long delicate feather-slit fronds bent over to the ground in graceful arches and so formed the loveliest vault: a peculiarity which particularly in the case of the *Cyathea* led to this fairy-like canopy being set in graceful swaying motion with the slightest breath of air. The *Alsophilae* also proved to be new species; *Alsophila oblonga* Klotzsch, and *Alsophila gibbosa* Klotzsch.

411. After crossing this fairy forest for some considerable time on fairly level country, the path suddenly assumed a character the very opposite. It made its way down steep ravines, and from their depths out again up similar ones, where the crawling tree-roots and almost impenetrable forest plants and creepers contested our right to every step: each height, so soon as we had mastered it, was greeted by the Indians with a shout of joy, although it remained doubtful whether this expression of feeling ought not to indicate greeting of some new gulley gaping at our feet. The track again followed a course down into the very depths to the small mountain streams which, with their crystal ripples, hurried over the sandy ground, when all the trouble, labour, sweat, and heavy breathing would commence afresh. We had only just climbed the steep rise of another such ravine when the brighter verdure, together with the sun stealthily shining through the dense foliage of the gloomy forest, showed that we had reached its opposite edge: before we could get out of it we still had to force our way through a thick mass of fern (*Mertensia pubescens* Willd.) entwined and entangled with innumerable creepers which to our great relief enclosed a large cassava field for, even though the roots had not yet reached maturity, it indicated the proximity of a settlement. We crossed the plantation with lighter hearts, then up a steep bit of rising ground, and there deep down below us in the valley stood the friendly and welcome houses of Humeseta village. Picturesque mountains towered up again in front of us in the N.N.W. and N.E.: mountains of which Apamapo and Mukuripa were pointed out to us in the North, Pa Epping (Frog Mountain) in the W., with Camarazin and Carimamparu in the N.W. Never before, nor since, have I seen such a beautiful display of Nature as was now once more unfolded before my eyes, an effect to which both the organic and inorganic world were

equally laid under contribution. The loveliest collection of flowers covered the slope of the mountain on which we stood. In a motley mixture of infinitely delightful variation, Flora, influenced by a spirit of banter, seemed to have scattered with mad redundance the most diversified tints of *Andromeda*, *Thibaudia*, *Vochysia*, *Bonnetia*, *Ternströmia*, *Archytaea*, *Gomphia*, *Bejaria* and *Clethra* over the horizontally layered picturesque masses of sandstone which here formed pleasant terraces and there wall-like precipices, the latter again decked with the lichens (*Cladonia*) already mentioned. In between thousands of fragrant *Sobraliae* and other orchids as well as 6 to 8 ft. high flowering bush, the path now in the valley led over a small stream towards the settlement which was soon reached. Humeseta consisted of 5 houses, two of which however were still under construction, and 50 red-painted residents who, inquisitive and surprised, were gazing at us pale-faced strangers with our extraordinary baggage. Even before actual arrival, our two Indians had come out to meet us with the hardly encouraging information that here also we should only find just enough provisions as would prevent us starving. The luckless war which, like the Trojan, a woman had kindled, had likewise brought scarcity and want into this dale.

412. Through being repeated so often during the past few days disappointment had almost become habitual, but alas! our pinched and discontented stomachs would not accustom themselves to hunger. Chaffing and smiling in sympathy our followers looked first at their emaciated figures and loosely hanging folds of skin and then at the piece of cassava bread hardly the size of their hand, and the two half-ripe plantains that fell to each one's lot when the provisions were divided. However much the stomach might want, the mouth was silent: with stoical equanimity our men had withstood the enforced strain of several days' fast with more than usual endurance: they knew it was not our fault, and quietly and willingly fulfilled the duties, now doubly heavy, that they had undertaken. Though their mouths were silent their very appearance made open complaint. Had anyone in Germany told me that within three or four days hunger could turn an otherwise healthy man into a skeleton, I should immediately have come out with an emphatic No!—with the South American Indians this is, however, not only possible, but is actually the case. Even at the end of the second day, after the curtailing of the accustomed rations, the ribs and remaining bones became more and more prominent over the hitherto fleshy figures, the fat body fell in, and like someone else's clothes the otherwise well-stuffed skin of the belly, hung down in folds. However incredible the following may appear, it is nevertheless true that after they had consumed their share of the rations all at one go, one would think them unable to get another morsel past their lips for the next 24 hours—yet they puckered up this wobbly skin in their hands to show us how much more they still wanted before its previous well-to-do condition could be restored. This fulness of body is resumed just as quickly as it is lost.

413. As the two still incomplete buildings could not accommodate our party, we pitched camp close by in between the picturesque groups of

tree fern, around which the whole population was soon gathered. Two of our carriers, villagers from Torong-Yauwise, had agreed to accompany us as far as here, and were anxious to get back the following morning: the want of food, met with throughout the trip, found them ready to do all and everything except to accompany us farther. The number of young men among the Humeseta residents as well as the friendly and pleasing reception with which we had been received, prompted us to ask the captain, after warming the cockles of his heart with a few small trinkets, whether he could not manage to get some of his young subordinates to accompany our men who were returning to fetch the goods wanted on the journey that had been left behind at Torong-Yauwise. The carriers required were soon forthcoming. We could not spare any of our coloured people, and therefore none could accompany them in order to guard our property: but the honesty of these Indians was a more certain guarantee than any other protection could have been. After we had fixed ourselves up, curiosity led me to have a peep inside the houses where poverty and dirt had taken up their abode. Large heaps of gnawed palm-stones, and maize-cobs without grain covered the floors of the first three that were entered. Except for the blowpipe and some bows and arrows almost all the implements generally met with in Indian quarters were wanting: there was only a number of hair-belts (Matupa) and thick bundles of still unplaited long black hair, the bay-leaf for bravery in the war hardly as yet completed which showed that the occupants were no cowards: everything else was missing except the large paiwari trough, painted with numerous figures, that proudly occupied the middle of each empty building. As the residents were all outside examining the Palefaces and their luggage I was able to have a quiet look round without being interrupted, and was just about to inspect the trough to see what the figures on the other side were like when a piercing shriek rang out from a hammock in one of the dark corners of the house. It gave me such a fright that I stood stock still, and now recognised in it the most pitiable nude and prostrate figure of a female who had been unable to withstand any longer the fright caused by my strange appearance. So long as the white man kept his distance, the sick creature had remained perfectly still and watched my movements: but as I gradually drew closer and closer to her, she could not refrain shouting for help. Shrieking wildly this veritable picture of misery tried to jump out of her hammock, which she was only prevented from doing by weakness. Her appearance likewise gave me quite as much a shock as her cries for help, and I quickly made my exit.

414. The thrillingly magnificent meteorological phenomenon that had hitherto taken place every evening, was to-day repeated to a degree never previously reached. The roaring of the thunder, the quivering lightning, the almost unbroken sombre masses of cloud with their edges, lashed by the confined hurricane, equally as dazzlingly illumined as our own immediate surroundings, the crackling boom of giant trees uprooted in the neighbouring forest by the wild whirlwind which seemed to be smashing up everything around and under it, the obligato accompaniment supplied by the thunder claps for the dull rustle of the rain pouring from the broken clouds—to put the matter shortly, all and everything

conduced to fill us with a holy terror. I had never experienced such an uproar before. The quantity of water that fell during that hour must have been 4 inches. In spite of the innumerable strokes of lightning none would seem to have struck, an event which the Indians assured us took place very rarely. Is it perhaps because the electrically charged clouds pass so high over the surface that the contained fluid cannot reach it? If that be the case, one must conclude that the lower cloud layers cannot enclose any. In the course of an anxious hour the clearest of starry heavens shed its soft light over the surrounding objects now reposing in the depths of silence: the rain drops from the branches and leaves and the crashing of a tree now opening a path for the first time were the only indications of the whirlwind that had swept the mountain vale. In the morning the thermometer read 63° Fahr., a temperature that caused our teeth to chatter and forced us to make sharp progress.

415. Our road lay along an undulating valley, now straight to the North. After crossing the river Cuino which flows towards the Zuappi from the N.W. it again went up-hill. The top was reached, and there before us, to the N.E., rising in the dusky blue distance like a black sharply defined gigantic wall, was a dark clump of crag which the Indians greeted with the cry of "Roraima, Roraima!" But hardly had the greeting been repeated than an envious veil of cloud again hid the sombre gloomy massif, the goal of our journey, even before I had secured a good view of it. Our old friend, the mighty dome-shaped Zabang, of which we had only very rarely lost sight throughout the entire trip over the ranges, towered again in the east with all its pride of majesty up above the mountains around, and likewise maintained from here its well-earned claim to Olympus. The mountains in our immediate vicinity rose in mighty terraces that could not have been laid more skilfully by human hands and here and there even jutted out into the most regular bastions of which the mathematical precision of slope and sharply corresponding angles could hardly upset the belief that the square and plummet must have been used in their construction.

416. The path now went down hill again into a valley replete with an abundance of tropical vegetation, and through a thick oasis of lovely isolated virgin forest trees and still more beautiful tree ferns: on its farther edge we met one solitary house the occupants of which were surprised at seeing our pale faces and set some roasted maize before us. In the afternoon our course took a stretch along the 30-ft. high northern or left bank of the Cuino: it was covered with tree-like grasses and *Zingiberaceae* and in spite of its height showed the most unequivocal signs of having been flooded over. On its southern bank there rose Mounts Camarazin and Carimamparu, the river taking many a turn at the foot of the latter. We were actively pursuing our way onward towards evening through a valley with alternating oases and savannahs to which Mount Apamapo, running from S.E. to N.W. some miles to the eastward, extended, when,—just as we were about to pitch camp on the edge of an oasis at the foot of Mt. Mukuripa that had blocked the outlet to the northward ever since morning,—we noticed a large ant-bear, the first mammal met with since Torong-Yauwise, harmlessly and leisurely

coming out into the open, nothing dreaming that death was so close at hand. Armed with cutlasses, two of our smartest hunters rushed on the now startled creature, with a view to cutting off retreat from the oasis whence it had just emerged, and also from the one ahead: in spite of the quarry breaking into a jog-trot the light-footed Indians fortunately succeeded in doing this. On realising the impossibility of flight, the frightened animal squatted quietly on its haunches, and assumed a respectable posture of defence. It tried to ward off the oncoming enemy with the powerful blow of one of its forepaws while firmly pinning itself to the ground with the other, but this manoeuvre was soon outwitted because, while busied with one of the hunters in front, the other slunk round behind and split its head with a cutlass, a blow that found recognition in the cry of triumph raised by us spectators. It was a female of unusual size. With a girth of 2 ft. 8 in. its length was 6 ft. 9 in. inclusive of the tail, which measured 2 ft. 7 in.: the round pointed tongue was 1 ft. 4 in. long. The negroes boiled the skin of the tail to a jelly, a dish which they considered to be an especial delicacy.

417. Break of day found us already on the road only to be met once more with a continuous series of hardships and troubles. After climbing the western terraced slope of Mukuripa for about 200 feet, we went in about an hour's time down into the valley again. The deeper the depressions and valleys, the more plentiful were the swamps fed as they were by numbers of small mountain jets dropping from the precipitous slopes. *Lisyanthus, Schultesia, Rhexia, Spennera, Commelyna, Eriocaulon,* all thrived splendidly on the swampy ground. We crossed the Cuino in the neighbourhood of its source which must be on the northern slope of Putiparu and rested for some time on its bank, to acquire new strength for the ascent of this mighty, steep and bleak mountain which robbed us of a view to the north. The crystalline water of the welcome stream bordered with its *Mauritia* palms, babbled noisily over the gravel and quartz rubble as it hurried on its way to the main river: it was in and amongst this rubble that a number of rounded-off pieces of reddish-white banded clay were to be seen. However difficult it might be to leave this desirable haven of repose, the tiresome ascent had nevertheless to be made. The climb began, but the steep slope soon consumed the strength gathered in the valley, and it was only after short stoppages for rest that the journey could be again resumed. Up to a height of 2,000 feet the slope was still covered here and there with a grey stiff grass as well as with isolated bushes of a 2 ft. high thick and stiff-leaved strange *Composita* which on closer investigation turned out to be a new species, and named *Pachydermatophyllum Schomburgkii* C. H. Schultz Bip.: beyond that height the masses of sandstone again became visible in horizontal layers to form immediately afterwards the perpendicular stone walls on which, to the great astonishment of us all I discovered a complete series of picture-writings. Unfortunately, owing to atmospheric action, a large portion were already weather-beaten: they were mostly rough representatives of human figures, kaimans and snakes, and hence differed essentially from the hieroglyphics at Waraputa Falls. According to the description which Alexander von Humboldt gives of the picture-writings

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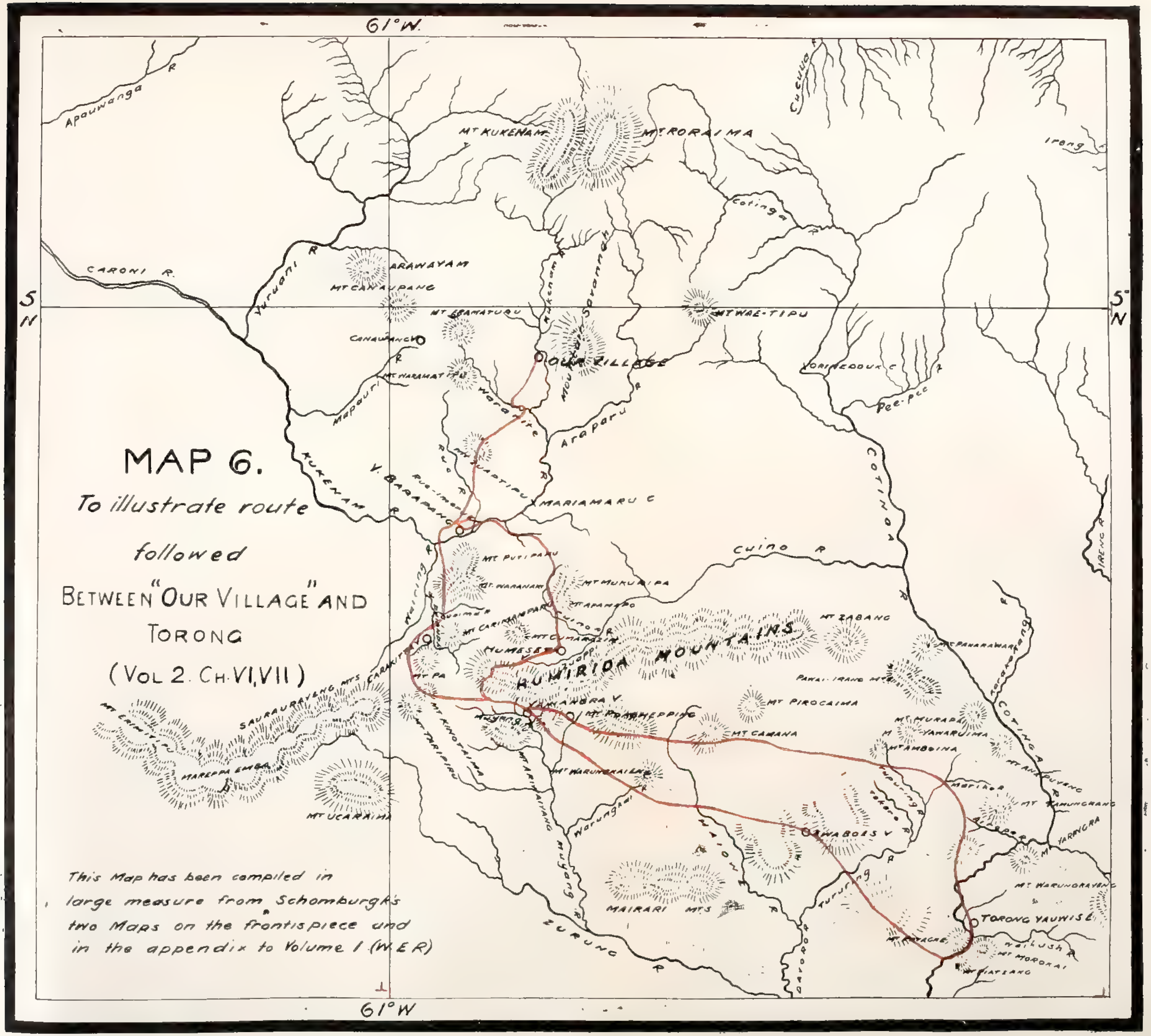
61°W.
5 N
5° N
Apouwanga R
CARONI R.
Yuruani R
ARAWAYAM
MT CANAUPANG
MT ERAMATURU
CANAUANCH
R
MT HARAMAT IPU
Mapouri
MT KUKENAM
MT RORAIMA
Cucuya R
Ireng R
Cotinga R
Kukenam R
Mount Savannah
MT WAE-TIPU
OUR VILLAGE
Waranite
Araparu R
Yorinedour C
Pee-pee R
KUKENAM R
V. BARAPANG
Pui-imer R
Ruo R
MT KUARTIPU
MARIAMARU C
R
COTINGA R
Cuino R
IRENG R
MT PUTIPANU
MT WARANAM
MT MUKURIPA
MT APANAPO
Quoimer
MT CARIMANPARU
Weiring R
Cuino R
MT CIMARAZIN
HUMESEB
RUMIRIDA MOUNTAINS
MT ZABANG
MT PANARAWARI
SAURAURAYENG MTS
CARAKITA
MT PA
MT ERIMIPU
MAREPPA EMBA
MT UCARAIMA
MT KINOTAIMA
MT TARIPIRU
MT ARIMAIYANG
YAMANBRA V.
Muyang
MT PRAHHEPPING
MT PIROCAIMA
PAWAI-IRANG MTS
MT CAMANA
MT MURADA
M YAWARUIMA
MT AMBOINA
Rapapang
COTINGA R
MT ANAPUYENG
MT KAMUNGRANG
MT WARUNGRAIENG
Warungai
NAIONE R
Hupuring R
Takara R
Mariker
Aiaper R
YARINGRA
CAWABOES V
R
Muyang R
MAIRARI MTS
ZURUNG R
Daroror
Turuiring
MT WARUNGRAYENG
TORONG YAUWISE
Waikush R
MT MORORAI
MT PITAGRE
MT PIATZANG
61°W

MAP 6.
To illustrate route
followed
Between "Our Village" and
Torong
(Vol 2. Ch. VI, VII)

This Map has been compiled in large measure from Schomburgk's two Maps on the frontispiece and in the appendix to Volume I (W.E.R.)

V. ROTH, del.

discovered by him on the granite rocks of the Caycara on the Orinoco, and the Culimacare on the Casiquiare, corresponding with those found by von Martius at the River Yupura, the picture-drawings met with here also belonged to the same epoch, the same people. When the Indians first noticed them, they called out in subdued voice "Makunaima, Makunaima (God, God)!" The series met by von Martius extends between 75° and 76° long. W. a few minutes south of the equator: Alexander von Humboldt found his between 2° and 3°, 7° and 8° lat. N., and 68° to 69° long W. from Paris: according to an approximate astronomical observation by my brother ours were 4° 40′ lat. N. and 61° 3′ long W. from Greenwich. If we include the finds of both the above mentioned gentlemen with our own observations the result is that these hieroglyphics and sculptures, as far as they have as yet been discovered, are spread over a superficial area of at least 12,000 square miles (15 lineal miles to the degree), in fact over the watersheds of the Corentyn, Essequibo, Orinoco, and portion of the Amazon. My brother found them on his first journey of exploration of the Corentyn on Timéri Rock in 4° 37′ lat. N. and 57° 45′ long. W.: they were again met with in the neighbourhood of the Great Cataracts in 4° 21′ 30″ lat. N. and 57° 45′ 30″ long. W. He also saw them on the Berbice in 4° 56′ lat. N. and 58° 9′ long. W., as well as on his last expedition down the Trombetas in 1° 27′ lat N. and 56° 41′ long. W. He likewise noted them on the Cuyuwini, that flows into the Essequibo in 2° 16′ lat. N. and besides this in 1° 40′ lat. N. in the upper Essequibo itself. On the Putiparu they are to be met again in 4° 40′ lat. N. and 61° 3′ long. W., and at Kukenam in 5° lat. N., 61° long. W. According to this review the area over which they were found partly by my brother alone, and partly by both of us together, extends from 1° 40′ to 5° 15′ lat. N. and 56° 41′ to 62° long. W. Though I absolutely decline to pass judgment on the many hypotheses that have been suggested by several very well-known travellers and archaeologists over these relics of an unknown past and its degree of culture, they nevertheless seem to me to indicate pretty forcibly the existence in its essentials of a similar state of civilisation among an earlier and more numerous population.

418. The summit of the mountain was still several hundred feet above where we were. To ascertain the height of Putiparu, my brother climbed to the top and found it to be 4,000 ft. above sea-level. After we had ascended another 80 feet, there stretched out before us to the north, down at our feet the valley of the Kukenam and several of its tributaries, which like silvery bands made their way through the smiling lowland to disappear here and there in the dark isolated bits of forest only to reappear in situations where least expected, until they finally joined their main stream. Sombre Roraima loomed up again far away to the northward. Our attention was directed from it to a steep declivity, at not too great a distance away, over which a foaming torrent was rushing down to bury itself in between the tree-tops of the forest stretching away below. The outcry of the Indians "Rué-imeru, Rué-imeru" told us that it was the falls of the river Rué. It was a long time before we could turn away from this lovely picture that was displaying its charms in the Kukenam valley deep below, even when, on the other hand, curiosity forced us to

get as close as possible to such an imposing waterfall that already at a distance had exerted so appreciable an effect. The impression to which this sublime valley and its beauty spots gave rise was strong enough for fatigue and hunger to be temporarily forgotten.

419. As far as we could follow the Kukenam from the situation where we were, it came from the N.E. and then flowed to the N.W. The way into the valley led alongside a small mountain stream that took its rise on the northern declivity of Putiparu, flowed into the Kukenam, and was banked in with a thick bush of *Clusiae* in full bloom. We entered a forest full of trees reaching to the skies and soon stood on the banks of the Kukenam the breadth and depth of which peremptorily called a halt. Wading was out of the question, but how to get the baggage over dry? A raft had already been proposed when one of the accompanying Arekunas told us that Barapang Village, not so far away, possessed a corial which he would be willing to fetch with another Indian, and so stopped us putting our plan into execution. The two of them pulling hard swam across the river and disappeared in the thick forest scrub: the other remaining Indians amused themselves in the water, while we watched them and relieved our tired limbs with a rest in the sombre shade of the timber. In the course of an hour both the powerful paddlers were back with the little corial and three hours later we were able to resume our journey on the opposite bank, the path soon leading us to the open savannah on which we climbed the rising ground from which the Rué rushes down into the depths. Six to eight miles to the N.E. the Kukenam rolls over the same steep declivity and forms the big Mariam-aru Fall. Barapang Village, which consisted of a single huge house, stood on the flat of the hill. Before reaching it I noticed a large blackish tiger-cat (*Felis Yaguarundi*) sitting on a rock boulder not far from the pathway, and as a group of residents were standing at a spot hardly a hundred paces distant, I naturally supposed the strange beast was the tamed property of the settlement, and therefore resisted all idea of shooting it. On getting to within about 50 paces of the wily animal which was watching me, it left the spot and hurried into the bush close by. My supposition was wrong: the Hacca-arowa, as the Arawaks call this cat, did not belong to the settlement, but to the forest, and all further search for it with the dogs proved fruitless. The 21 occupants of the huge oblong hut, the high roof of which rested on strong mud walls, gave us a hearty welcome: the large number of dogs on the contrary barked and howled at us angrily and could only be momentarily soothed with the greatest difficulty on the part of the women. It is strange that dogs have such a strong aversion to Europeans, the reason why it is a risky business for travellers to approach an Indian house guarded by them. They made friends at once with our brown attendants, who like ourselves were visiting them for the first time. This aversion or fear of the European is exhibited by other domesticated animals in the Indian household. Some yams, unripe bananas, and the promise to send a messenger to the nearest settlement to get them to let us have a portion of their scanty provisions also, was all that could be done on behalf of our

stomachs clamouring in revolt. Though stretching itself out so charmingly before us, neither the lovely valley of the Kukenam, nor the delightful mountain panorama could silence the cries of hunger. The Kukenam after being joined some 6 miles further to the westward by the Wairing runs a course towards the N.W. into the Yuruani which, under the name of Caroni, flows into the Orinoco. It was too late in the day to pay the Great Falls a visit. Our carriers sought their night's lodging inside the house, but we on the contrary pitched our little tent outside, where, however, we found but little rest owing to there being amongst our Indians a piai who spent the whole night in curing the fever-stricken Barapang chieftain of his complaint.

420. We woke in the morning shivering with cold and the thermometer still barely 60° Fahr.: we were 3,230 feet above sea-level. Our anxiety to see the Falls, the grandeur of which we were anticipating, together with the frost, sent us scurrying down the slope into this deep narrow gorge in Nature's wonder-land, whence the turbulent noise of its waters was already heard thundering out of the valley. The way was fascinatingly beautiful and the air filled with the sweetest of perfumes. In between *Thibaudia, Andromeda, Ternströmia, Bejaria, Vaccinium,* glorious *Sobraliae, Cattleyas, Epidendrum* interspersed with roseate blooms, and isolated trees of *Ladenbergia Roraimae* and *Ladenbergia Schomburgkii,* we arrived at the forest extending to the base of the steep declivity. The wild din of the split-up masses of water increased with every forward step until we unexpectedly came upon a downward-sloping terraced stratum of dark red jasper from which, through the fresh verdure of the trees and scrub, we saw the unshackled element dissolved in thousands of foam-flakes shimmering quite a hundred feet below. The precipitous slopes of the bed of jasper were soon left behind, a rocky ravine revealed itself in front of us, and the foot of one of Guiana's mightiest and most picturesque waterfalls* was reached. From over a 120 ft. high absolutely perpendicular jasper wall, and breaking into foam and mist when already half-way down, the mass of water poured on to a broad shelf of similar material to form, after this first mighty plunge, another 16 cascades from 4 to 40 ft. high and 1 to 8 ft. broad when, at the very foot of the last one, it finally joined the Kukenam after a total drop of say 220 feet. Dumb with astonishment, and enthralled at its terribly sublime aspect, we gazed upon the tumult of the struggling waters, the deafening thunder of which swallowed up every other sound. It was not without difficulty that we broke our way through the wall of vegetation, which on account of its foliage being kept continually on the move by the air current, allowed the foam flakes collecting on it to fall upon us in heavy showers, and so reached the foot of the Great Fall. Here we gazed up at the white blue clouds and down at the enchantingly beautiful series of cascades, the crystalline waters of which, tinged by the dark brown, red and rosy ledges of jasper with the most varied shades of colour, were rolling in between a superabundance of vegetation, as can only be

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* The Kaieteur (Kaieteuk) Fall on the Potaro was not discovered until 1874. (Ed.)

produced under a tropical climate and a continually damp atmosphere, into the tranquil bed of the Kukenam. Mosses, lichens, and ferns overran the immense blocks of gneiss that lay around its base, and covered the sandstone strata which here and there came to light, with a green puffy cushion, while climbing Aroids, *Monstera cannaefolia* Schott, *Anthurium gracile* Lindl. and other creepers stretched themselves over the same like scattered garlands: the most beautiful tree-ferns shot out from between the mighty boulders, and the shadows of their swaying fronds danced like elf and fairy upon the verdant cloth. Even the clefts in the masses of jasper were not without their living clothing: small well-nourished ferns, *Jungermanniae* which stuck on to the red walls in more or less thick turf, a new and glorious beautifully scented *Cypripedium, Cypripedium Schomburgkianum* Klotzsch et Reichb., and the dainty *Angelonia salicariaefolia* Humb. Bonp. had taken up their abodes in these fissures. The wall of vegetation that rose up on either side consisted of *Qualea rosea* Aubl., *Kielmeyera angustifolia, Gomphia, Vochusia* and white blossomed species of *Psidium* and *Laurus*, above which the proud and slender *Euterpe* waved to and fro with every breath of wind. On my way to the top I found *Rapatea Friderici-Augusti* Schomb. in the thick forest. Amongst giant *Cyperaceae*, particularly *Diplasia karataefolia* Rich., *Cyperus ferax* Rich. with its bromelia-like sharp 5 to 6 ft. long leaves, and *Tillandsia bromeliafolia*, which seemed to sprout out from the stems of the trees, I reached a point of view that enabled me to gaze over the whole of the glorious spectacle. The river Rué comes from the North towards this terrible precipice in a bed from 30 to 40 ft. wide. It was impossible for me at least to keep my eyes for long on the frothing whirl of waters: thousands and thousands of quizzing and leering eyes peeped out of the thundering waves, the trees left the spots that had nourished them so well, the atmosphere became a heaving sea out of which innumerable lightning flashes flared in front of me, another second and a sickly giddiness would have dragged me down into the unfathomable depths. The Fall and the junction of the Rué with the Kukenam lies in 44° 43′ 4″ lat. N. and 61° 5′ long. W.

421. Delighted with what we had seen, we returned to Barapang through the gloriously enchanted garden of flowers, and were attracted by a number of beautiful *Ladenbergias*: on the Humirida Ranges, at a height of 3,690 ft. above sea-level I had often noted them as bushes, but here at a height of 3,230 feet the *Ladenbergia Schomburgkii* and *Roraimae* were found only as trees.

422. There cannot possibly exist such an equally comprehensive literature regarding any family of plants as there is concerning the *Cinchonae*; and yet the knowledge of its geographical distribution in America still leaves much to be desired, for every recent record of travel has always something new to add to the older ones. However frequent the attempts to ascribe the discovery of its action to this or that particular circumstance, all the arguments that have been brought forward in this connection must be relegated to the limbo of Fiction that has always accompanied every scientific discovery. According to Geoffroy,

some Indian, seized with fever, must have drunk out of a puddle into which several fever-bark trees had fallen, and so got freed from his fever: according to La Condamine, although he himself doubted the truth of the statement, it was the Pumas who drew men's attention to it, because at the annual attack of fever to which this species of animal is subject, the disease is cured by the animal devouring the bark,—and a lot more nonsense of that description. Apart from all the self-conflicting statements of the oldest authors, of whom the one maintains that the aborigines were cognisant of its curative properties and applied it in cases of fever already before the arrival of the Spaniards, while the other denies it—to be sure, La Condamine shares the latter, although corroborating the former view—this much has become apparent through the experiences of more recent travellers, particularly those of Alexander von Humboldt†, that we have to thank the Europeans and not the autochthonous natives of America for the discovery of this efficacious remedy. Our celebrated explorer found the natives of Guiana just as ignorant concerning the properties of the bark as my brother discovered them to be on his first journey, and now here again we met with Arekunas and Macusis who were living in the midst of these very trees, while at the same time they were being attacked by fever. I have only interpolated these few remarks with a view to fitting in our own experiences with those already known. We gave quinine to fever-stricken Indians and earned their everlasting thanks, yet within a few paces from their bed of sickness the essentials of the remedy were flourishing in superabundance.

423. On our return to Barapang we found several Indians from the next settlement who on account of the unhappy war were unfortunately unable to bring anything but a few bunches of plantains and bananas: our midday meal to-day consisted of as usual a very meagre dish of roast plantains. The silent resignation to our lot had however to receive its reward during the course of the afternoon, when a fresh party of strangers brought us not only some newly made cassava cakes, but also two fowls: the former was divided amongst our carriers who were daily turning more and more into skeletons, the latter which the Indians, although more tormented with the pangs of hunger, refused to eat, we took possession of ourselves. Notwithstanding that all the hopes that the Indians, who had attached themselves to our party since leaving Torong-Yauwise, may have cherished with regard to the next settlements had hitherto been deceived, several Indians from Barapang accompanied us next morning in spite of their being fully aware that we should find equally as few provisions at Roraima. Curiosity however was stronger than their commonsense.

424. Our road took a course N. by E., and after an hour's march we reached the river Rué which came from N. by W. After an easy crossing of its bed and banks that were bordered with a rich growth of vegetation amongst which a tree, *Peridium ferrugineum* Schott., owing to its peculiar covering of flowers, especially attracted our attention, we went

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† —Alexander von Humboldt: über die China-Wälder, Berliner Magazin p. 59.

on towards the western slope of the Zuaptipu Range and soon climbed it. Here, upon and in the alternate rises and hollows we again came across some small sporadic bushes of *Byrsonima* and *Melastoma.* The heights were generally covered with sandstone and quartz fragments amongst which were to be found isolated pieces of a horn-blende sort of rock that later on might perhaps become refined slate, and peculiar gravelly clay-concretions [Sect. 428] which in formation corresponded with that of so-called "thunderbolts" and measured from 6 to 8 inches in length. What struck me most were the immense blocks of grained sandstone with a white cementing material which I had to conclude was chalk.

425. So far we had never come across such geognostic multiplicity in so small an area. The path led away on the eastern slope partly along the very crest itself and partly quite near it (i.e., the ridge) and so we continually enjoyed the most charming outlook over the Kukenam valley running from N. to S. with which that of the Araparu coming here from N. E. was connected. A few settlements which, according to the statements of our Indians, had been abandoned by their occupants reposed at rest on the thick belt of vegetation of the Kukenam and formed a picturesque break in the lovely but lonely valley scenery. Not a human being, not a mammal, not a bird interrupted the profound peace, the solemn silence that spread over the vale. Where the river approached the base of the mountain chain, the shady foliage trees disappeared and a thick tangle of wild bambu, tree-like grasses and *Zingiberaceae* took their place. We had now reached the highest point of the ridge, and the ever closer advancing Roraima Range, the reddish sombre colouring of which we could already distinguish, again limited the hitherto hidden North. At its side rose a similar wall-like mass of rock which the Indians described as Mt. Kukenam, the source of the river of that name. Our old friend Mt. Zabang greeted us from the S.E. over the tops of innumerable mountain peaks. The envious clouds again only allowed us a moment's grace to enjoy an undisturbed view of the imposing geological wonder, Mt. Roraima, in which, from here, I fancied myself greeting the Königsstein, Mt. Kukenam being the Lilienstein.* Whilst following the highest elevation of the Range in a more westerly direction we came across a lonely house, in which we looked for its occupants in vain. Deep below in the valley of the northern slope near the western bank of the Kukenam, we also noticed a building in front of which a number of Indians had collected who must have noticed us already, judging by the restless activity that suddenly developed itself in their midst. So as to allay the fears engendered by our unexpected appearance, and prevent them taking to flight, we sent ahead two of our Arekunas to acquaint them of our friendly intentions. In a deep cleft, covered with compact trees to half-way up the mountain-height, we reached the plain and in front of us stood the house where the reassured occupants awaited us with—thank goodness!—a number of fresh cassava cakes and pots full of pepper sauce and Yakus (*Penelope*). A repast was inviting us such as I had never enjoyed before. As soon as our

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* —Two celebrated mountains in Saxon Switzerland. (Ed.)

awful hunger had been satisfied, I had a look at the red-painted Indians who stood wonderingly around us. Besides the little sticks of painted bambu which they wore in nose, ear, and underlip, the small boys were decorated in addition with little bits of golden-yellow skin which appeared and was subsequently confirmed to be a species of monkey's. Upon enquiring from what animal it had been obtained they told us from a monkey called Arauta, a description that did not help us very much because an Arauta was just as equally unknown to us: later on it was learnt that it belongs to the genus *Mycetes*, but that on account of its golden yellow colouring it differs essentially from the *Mycetes seniculus* as met with on the coast.

426. The provisions being consumed, several of the residents were prompted to betake themselves with their blow-guns to the neighbouring forest and fill the pots anew with game: that their efforts were crowned with success was shewn on their return. Amongst Arekunas the blow-gun appears to be the general and especially favoured weapon: it was only rarely that I saw them go out to hunt with bow and arrow.

427. As the house could not accommodate the whole lot of us, those of our Indians for whom no room could be found went off to the neighbouring forest where they slung their hammocks, we pitching our tents close to the building. At a short distance beyond our tents the Araparu joined the Kukenam, the banks of which contained several forms of plant life still unknown to me: amongst such, the especially large trees of *Clusia insignis* with their large waxy-white roseate-tinged blooms, and a new species of *Peridium*, *P. bicolor* Klotzsch, rendered themselves conspicuous.

428. The night was unusually cold: in the morning at 6 o'clock the thermometer read 62° F., which was uncommonly trying to us and to our Macusis. If pressing want, and the hope of obtaining relief from their tribal relatives in other villages had induced the occupants of the previous settlements to attach themselves to our company, such inducement was no longer forthcoming considering that, after closing their palm-frond house-door, we were followed on our departure by the Indians collected here. Our train was accordingly appreciably lengthened, but of course those who came of their own accord had to provide for themselves. Through forest oases with babbling little brooks and over hills on which large masses of the cascalho-conglomerate already met with [Sect. 424] were visible, we turned towards the W. in which direction we were forced by a mountain that we, not wanting to climb, followed along its base. Besides this pebbly conglomerate, we again found to our astonishment, along the slopes, some of those glossy clay concretions, coloured black and brownish-red with iron oxide, and quartz fragments, that had particularly caught our eyes in such prodigious quantities on the banks of the Rupununi and Takutu. There, the absolute height of the area upon which we found them was 3 to 400 ft., but here on the contrary it was 3,200 ft. above sea-level.

429. On making our way out of the oasis we were taken aback at the interesting landscape. Before us in the west there arose a mountain chain from 600 to 800 feet high, covered with but scanty vegetation, over

which was laid a broad silvery band with its terminal disappearing in the forest that reached up to its base: it was a small stream pouring down the declivity in innumerable falls and cascades. We now proceeded on towards the N. and soon reached anew the valley of the Kukenam which was here joined by the Wararite in addition to several other tributaries the waters of which were streaming from the some 700 ft. high Waramatipu Range rising over the savannah in the N.W., and from the Eramaturu Range lying more to the North. In the neighbourhood of Wararite we came across one of those bee-hive houses with thick mud-walls which are especially peculiar to the Macusi. The closed entrance with its door made of palm-fronds also indicated the absence of its owners. After following its right or western bank for some miles and found a convenient situation we crossed the Wararite and once more traversed a dense forest oasis in which the *Guttiferae,* particularly the genus *Clusia* continued the most prevailing form of vegetation. I collected *Clusia insignis* Mart., *C. rosea* St. Hil., *C. bicolor* Mart., *C. leprantha* Mart., *C. macrocarpa* Spr., *C. microcarpa* Spr., and *C. nemorosa* Mey. Some of these species appeared even as parasites on other trees: this was what especially often happened in the case of the beautiful *C. insignis.* Still more was I astonished at the unusually dazzling abundance of blossom of the *Dimorphandra macrostachya* Benth., which rose like a majestic giant tree above the woodland. We sped briskly along the crest of an undulating range of hills towards the N.E. until, once more nearing the valley of the Kukenam, we saw below us and on its western bank two bee-hive houses in the process of construction with a number of red-painted Indians in holiday costume gathered around. We made our way down to them. The chief, a worthy old fellow in a shirt stiffened by filth, and his head covered with an old squashed hat off which the fur had all been rubbed and so gave it a reddish yellow colour, was seated upon a stool, surrounded by the eldest in the settlement, likewise clothed in the remnants of what had once been a white shirt but now hung in rags on his red-coloured limbs. He gazed upon us for a long time in silence and then commenced a speech which seemed to be without end. As the flow of language finally ran dry, he got up and offered his hand to each one of us Europeans, an action followed by all his subordinates from the oldest men and women to the tiniest boys and girls, with the expression "Bakong-Baimong" (Good day). Such an insinuating and hearty welcome from the gentler sex had never happened to us before, and this was all the more surprising considering that this was the first occasion they had seen a European. Men and women rendered themselves conspicuous not only by their beautiful figures, but also by their regular facial expression, and many of the women by their wonderful long black wavy hair. As with other Arekunas, the men here also wore bambu sticks in the septum of the nose, in the lips and ears: the faces of the women were unusually strongly tatued which was very detrimental to their otherwise very pleasant features.

430. After the salutation ceremony was ended, the girls and women hastened to provide us with some freshly-baked cassava bread, pepper

sauce, paiwari, and a vegetable resembling our green cabbage: this was made from the terminal shoots of the *Manihot* the first taste of which put us off any inclination for a second helping, because owing to the plentiful addition of *capsicum* we imagined we had swallowed nothing less than hell-fire. A look from the chieftain seemed to have appointed his wife and daughter as subservient genii for us Europeans, because they never left our side but placed before us everything eatable that the house possessed. Included amongst the latter were several small mammals smoked in their skins and hair, but which on account of their resemblance to rats we were afraid to try the taste of: they were called Atuh. It was an interesting picture, to watch more than 100 starved people divided up into a number of small groups squatting before the pots, filled but for a moment, and satisfying the wants of their stomach in Indian fashion—a satisfaction that had been denied them for a long time past.

CHAPTER VII.

"Our Village"—Manners and Customs of the Arekunas—Meteorological observations—Flora and Fauna of the Surroundings—Mountain-range Formation—Serekongs—Ascent of Roraima—Effect of the bite of a Death-adder—Sources of the Kukenam, Cotinga, Yuruani, Araparu, Cako, Cama, Apauwanga—Flora of Mt. Roraima—Leiothamnus Elisabethae—Encholirium Augustae—Meteorological observations—Return to "Our Village."

431. The Arekunas were just on the point of establishing a large manihot field in the forest oasis extending along the western bank of the Kukenam and were building the two bee-hive houses for their proposed settlement. Their real place of residence, Canaupang, stood at the foot of the mountain of the same name, some miles further to the westward from here. A smaller provision-field, that had already been brought under cultivation earlier, and planted with manihot and yams indicated sufficiently what a fertile soil the crops had found: both were nearly matured. The wretched war here also had been responsible for the removal of the village, since a party of Arekunas from the neighbouring village Arawayam had fallen upon the inhabitants of Canaupang by night and killed several of them. The pleasant valley of the Kukenam as well as the hearty welcome which we received from the people quickly determined us upon making this our headquarters during our stay in the neighbourhood of Roraima which lay before us in all its grandeur only some few miles to the N.E.: with this object in view, we made up our minds to build a few houses here. It was a picturesque spot that we had chosen for our stay. On the left bank of the Kukenam that wound over and between a number of jasper and quartz boulders was Mt. Savannah, devoid of all bush and foliage: in N.N.E. the red walls of Roraima and Kukenam almost always enveloped in thick masses of cloud: in West the isolated Erematuru: in South the undulating rising ground that we had crossed in the morning spread itself along. With evening, the terribly beautiful natural phenomenon, that has already been several times mentioned, again took place: but as the waters rolling down from the Erematuru made their way straight for our tent, we were forced to start building the very next morning, and for this purpose all hands were called into the most active requisition. The plans of our palace were soon sketched and the ground laid out. The neighbouring oasis offered sufficient material: posts for the framework, rafters for the roof, palm-fronds for thatching and covering the walls, bush-ropes for tying the individual beams and rafters: more was not required, and by evening the frames of the two larger houses were up on the spot that had been levelled. A huge quantity of the beautiful *Martinezia caryotaefolia, Maximiliana regia* and *Acrocomia sclerocarpa* that only yesterday had raised their proud heads high above the surrounding foliage trees were cut down next morning without mercy under the axe-blows of the Indians, to supply

leaves for the thatching of the roofs and sides. The fall of these palms is always accompanied by a peculiar whistling noise, due to the fronds cutting through the air so quickly. On the third day we were able to start with the furniture and out-fitting. Some of the tin boxes served as seats, two of them pushed close together formed a table, two of the stronger cross-beams were utilised for hanging our hammocks on, and a frame of laths was raised for holding the luggage, so as not to get it damaged by the moisture of the ground. A sort of shelf served as a place of security for my botanical and other natural history treasures and also protected them from getting wet and from being attacked and damaged by insects, especially the very dangerous ants (*Atta cephalotes*) the presence of which I was painfully enough made aware of during the very first night, by finding next morning even the plants under the press destroyed. A deep gutter around both houses served to carry off the water after a thunderstorm. By evening time the two little mansions stood before us completed and it was with feelings of pride, satisfaction, and comfort, that we regarded the results of our handiwork wherein for the first time we should be strengthening our weary limbs with a good sleep. It was the first, and to all appearances also the last, house of which we ourselves not only designed the plan, but shared the labour of its construction from the ground up. On the fourth day we commenced a third, fourth, and fifth building for our companions from Georgetown and our faithful Macusis, and a sixth to serve as a kitchen, all of which under the many skilful hands rose like mushrooms from the levelled ground. "Our Village" as we baptised our little place, already consisted of six houses by the fifth day.

432. After finishing the building operations, we paid our starved attendants their well-earned wages, to which we added some presents in recognition of the faultless manner in which they had fulfilled their duties, and let them go back home: our Macusis, devoted to us body and soul, alone remained with us.

433. The continual drain upon the provisions of the Arekunas at Canaupang had naturally caused them to disappear soon enough: we accordingly proposed buying from the friendly old chieftain, Kaikurang —who never failed to put on his dirty old shirt, and apology for a hat whenever coming to see us—a portion of his ripe cassava-field, out of which the women who had followed us from Pirara could supply our daily wants of bread. The piece of ground was communal property, a general conference had to decide the matter, and after a short discussion Kaikurang returned with their unanimous approval. Two axes and a cutlass, for the common property, and a few small gifts to the wife and children of the chief were the cost-price. On account of the women carrying out their specified duties from earliest morn till fall of eve, the next few days unfortunately showed that our field would soon be worked out. Nothing was to be expected from Canaupang because the plantations there had likewise been reaped and so help had to be sought from farther afield and according to what Kaikurang told us, this would be obtained from the Serekongs, a tribe occupying the district around the sources of the Mazaruni. One of the Indians offered his services as messenger to

hurry over there with a request for aid, although the distance was so far that the sun would have set eleven times before he could be expected back. A few small presents given him for the chieftain of the Serekongs were intended to make the latter more willing to carry out our wishes.

434. On the same day that the envoy took his departure, the occupants of the large bee-hive house that we came across at Wararite, returned from their journey to the Mazaruni. With the most evident surprise they stared at the buildings that had been erected during their absence, as well as at their residents whose appearance seemed to be quite inexplicable to them. Among the beautifully made men, for the most part decorated with the most fantastic feather-crowns, was to be seen a young girl whose extraordinary loveliness gave us still greater cause for astonishment: it was indisputably the most perfect female figure that we had ever seen amongst the Indians. Her strikingly-dark eyes, her long ebony-black glistening hair falling over her well-formed shoulders in natural curls, her small mouth so rare amongst Indians, with its faultless row of white teeth, the aristocratic turn of nose, the delicate and well-bred shape of hands and feet combined to make her so perfect that in spite of her copper-coloured tint even the most exacting of European art critics would have found no fault with her. The numerous beads worn by Cummiyaure indicated that even the marriageable Indian willingly bows before such female beauty, that the son of the forest is just as keen as the European in making sacrifices before the triumphal car of Helen, and that a girl like her appreciates the tribute paid her just as much as a white woman does. She was practically covered with strings of beads, the surest sign of her being the silent yet therefore no less passionate heart's desire of many an Indian. To give her practical proof of our esteem, we also presented her with several pretty strings of beads, an action that seemed to flatter her immensely, judging from the delightfully roguish and grateful smiles that fell to our share: nevertheless the sullen looks cast in our direction by her father, an equally perfect human figure with which was associated a savage grandeur that demanded attention and respect, as well as by a certain handsome young Indian, probably her languishing lover, showed clearly enough that the attention we were paying her was not agreeable to them. The contrast between the gloomy looks of the men and the sparklingly happy eyes of the dark-tinted Grace, that rested now upon the beads and now upon us, could have given the skilled pencil of Goodall a worthy subject for an interesting character-study had not the passionate artist busied himself too actively over the object itself. Bubbling over with excitement, he chaffingly asked the father to give him his daughter to wife, with the result that after looking sullenly at him for a second, he said something unintelligible to the girl who, like a frightened deer, kept out of our way for the whole rest of the day. Next morning her father, the chieftain, gave orders for striking camp, pretty Cummiyaure appeared again, smiled at us even more sweetly than the rising sun, received some more presents from us with a smile, and in spite of her father's gloomy demeanour bade each of us adieu with her pretty little hands, and when far away on the road, stealthily nodded to us a hearty

good-bye with her beautiful head of hair. We gazed upon the picturesque caravan for long, until it disappeared behind a bit of rising ground in the southward. It was just like a fairy tale or a passing dream: we were yet to meet sweet Cummiyaure once more.

435. The interesting spectacle that we had hitherto provided in almost every settlement that we stayed at, was also repeated here: hardly a day passed but processions of red-painted Arekunas came over the mountains to our settlement to whom it appeared equally suitable, as it had done to us, to quickly build their own huts. In the course of 12 days our village included seven houses more, on account of which almost all the palms in the oasis naturally disappeared.

436. The Arekunas are evidently a brother tribe of the Macusis: language, manners and customs apparently correspond with one another. The variations in the first-mentioned are purely dialectic, and in connection with the last there is specially wanting but one characteristic, and that is, cleanliness. The dirty habit of painting the entire body and not only the smoking of tobacco, but also its chewing in fair quantity—a habit that had not hitherto been noticed in any tribe—were, in their naive slovenliness the two chief causes that continually gave them an unwashed appearance. For chewing purposes, the tobacco leaves are not dried but are cut up very fine while fresh, and mixed with a black nitre-containing earth found on the savannahs, then kneaded into a dough, and so rolled into small marbles ready to be stuck in the mouth. The overflow almost always settles as a dirty black juice upon the lips and around the mouth: I have never seen women chewing it. Even before dawn the people leave their hammocks to bathe in the neighbouring Kukenam, after which comes the dabbing and streaking of the whole of the body with paint. Almost all the men wear the hair-belt (Matupa) over the hips, some also have a belt manufactured of spun cotton something after the style of a sausage: the women have necklaces made of the teeth of small rodents. The blow-gun, as I have already stated, appears to be their chief weapon. They barter the poison with the Macusis, to whom they give in exchange either the completed implement or only the rough stalk of the *Arundinaria Schomburgkii*, which they in return receive from the Maiongkong. Here also the mother suckles the child up to the third or fourth year, and when finding herself about to give birth to another, will hand over the last baby to the grandmother who fulfils all the functions of a mother to the grandchild: an ability that I have proved to be true even with the oldest Indian females. Their chieftains exert greater influence and power than do the Macusis. Every order of Kaikurang's was given in an earnest yet firm tone: immediate obedience followed it. Kaikurang always spoke in the first person plural. The Arekunas are only in indirect relations with Georgetown through exchanging spun cotton, hammocks, dogs, and feather-decorations for small articles of European manufacture with the Akawais who are not afraid of the dangerous journey up the Cuyuni or Mazaruni. Owing to the district being so poor in mammals and birds, and their mountain-streams only harbouring fish as small as one's finger belonging to the *Siluroid* family, particularly to the genus *Hypostoma*,

they are almost forced to a vegetarian diet: and notwithstanding this they cling to their native lands, particularly Roraima, with a love like that which in former times only a Swiss could always cherish for his Alps. All their festive songs have Roraima for subject matter, and when we told them of the beauties of Pirara with its broad savannahs, the numerous herds of cattle, the deer, the huge fish in the streams, and the superabundance of food, their comment was and remained "It cannot be nice in that place: there is no Roraima there." Every morning, every evening, the old and young, Kaikurang at their head, came over to our house to greet us with "Bakong-baimong" (Good day) or with "Saponteng" (Good night), and then on leaving us for awhile, would always add the words, "Matti Roraima-tau, Roraima-tau" (There, look at *our* Roraima), the *tau* being uttered with a very long and ceremonious drawl.

437. While among these simple good-natured primitive people it struck me very forcibly that it all depends upon the European, as to what he is going to make of them. The largest portion of them had never yet, and with few exceptions had only occasionally, met with Europeans. Heart and head still remained completely in childish harmony. Treat such an Indian as a friend so as to let him feel through intercourse with you that he is of the same flesh and blood that he honours and respects in yourself: do not budge a single hair's breadth from the truth: do not be guilty of any weaknesses which he may be inclined to commit: be circumspect in everything you do: do not repulse his friendly advances, however hard it may often prove, with harshness or false pride: share his innocent pleasures: let him see that you sympathise with his troubles and with his sorrows, and truly you will get on better with these folk than with the outwardly brilliant companionship of Europe: morality and virtue need not be brought from civilised Europe—Indians have a far more tender regard for them than we have.

438. Just as one of the visiting parties of Indians offered an example of extreme loveliness in a female, so did another present us with the most beautiful boy. Tamanua was the perfect model of childish charm and grace. His father came from Carakitta village, two days' journey distant, and was camped near us: the son was the darling of us all. In spite of the somewhat girlish expression of the gentle eyes which was still further increased by the long prettily-curled black hair, Tamanua was nevertheless a good shot with the blow-gun: he brought me daily a number of small birds such as *Euphone, Tanagra, Nectarinia* from his hunting trips, and in his soft and melodious voice demanded a price that however high it might be, none of us could refuse. If the son was a model of childish beauty, his father was one of adult life. When the latter wore his fantastic feather crown with its four up-standing tail-feathers of the Macaw, we always believed him the living image of a powerful Highlander standing before us, for which reason we dubbed him "Scotty." My brother's wish for Tamanua to accompany him to Georgetown was the cause of driving both father and son secretly out of the village one night, because on enquiring for the boy next morning we were told that his father, fearing that we might take him with us over the salt water to the land of the Paranaghieri, had led him home.

439. The climate and meteorological conditions of our colony were far from meeting with our approval. "Our Village" lay in 4° 57′ lat. N. and 61° 1′ long. W. some 3,300 feet above the sea. Between 4 and 5 o'clock of a morning the thermometer only once rose to 58°, at midday it was 87° in the shade and rarely more than 100° Fahr. in the sun. Besides this variation of temperature, an almost incessant change between fair and storm, cloud, rain and sunshine prevailed. Before sunrise and for about half an hour after, when the sky, apart from some light little clouds, was bright and clear, the mighty Mount Roraima would stand before us clear of clouds, with its straight-edged borders standing out in sharp contrast against the azure sky. But this was to be soon followed by the formation of thick layers of mist which quickly spread from the plains and dales over the entire surrounding country to be driven from there by a current of air wafting them to the higher regions whence they returned to earth as heavy rain. In rapid succession there now followed short intervals of the finest and brightest weather. The sun warmed the atmosphere just cooled by the preceding rain, to disappear again the very next moment behind the dark storm clouds. The rising mist would often include only a limited area: Roraima would be enveloped in dense cloud while the sun would strike the bronze-coloured rocks of the neighbouring Kukenam: or the base of one of these mighty masses of sandstone would lie buried in a deep dark sea of mist while its steep red summit sparkled in the most dazzling sunshine. Changes in connection with the atmospheric currents took place just as abruptly. With nature still lying in perfect peace, and not a breath of air stirring, I would be busily taking advantage of these clear and quiet moments in drying my damp drying-paper, which consisted of copies of "The Times" that I had bought in London as waste paper* when a powerful whirlwind would carry paper and plants in a spiral high up into the air whence to the very great chagrin of myself, but on the other hand to the intense enjoyment of the Indians, they would be carried on the breeze in all directions, often many miles away. In the course of our trips we have seen papers thus carried away flapping in the trees or found them on the ground again at considerable distances away. Even when climbing Roraima some of them had fluttered up to a height of 4,000 ft. right ahead of me. One learns by experience, with the result that the most insinuating bit of sunshine, and the brightest of skies could not deceive me again: every sheet had its paperweight. On the top of continual changes like these, 3 o'clock afternoon drew round, bringing in its wake almost daily, the wildest thunderstorm and heaviest rain in the twenty-four hours: if this climax did not appear by 5 o'clock, it would not come at all. The storm burst to the accompaniment of frightful thunder: later on, the rays of the setting sun once more poured over the red rocky walls of Roraima and Kukenam a magic fire wherein the sparkling silvery cascades and waterfalls pouring down from the flattened top, and swollen with the rains just past, formed a fairy-like contrast. I have already mentioned that the annual rainfall which amounts to about 100 inches for the coast and large savannahs is much exceeded here, and the Indians

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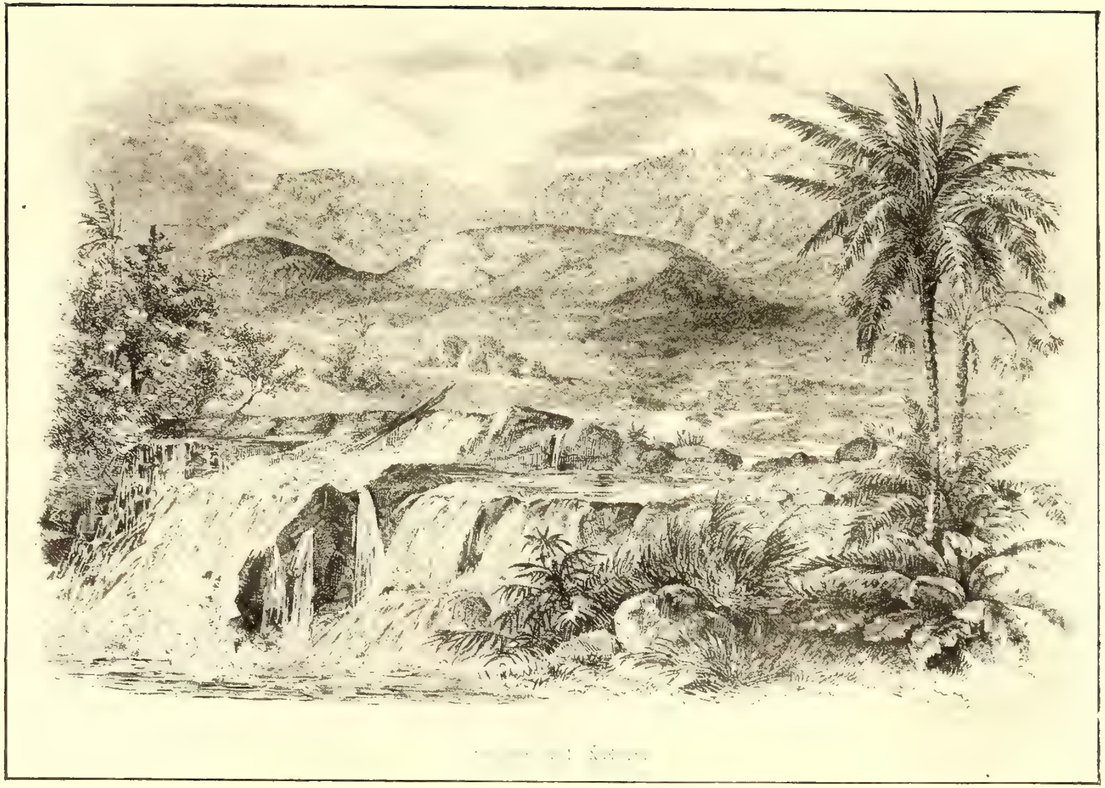
* Some of these scraps from the "Times" were subsequently used as amulets by Awacaipu the Medicine-man. See footnote on p. 202 (Ed.).

rightly call Roraima "the fruitful mother of the torrent." It was now the dry season on the coast.

440. For more accurate meteorological comparison I am including the observations carefully carried out here by the Expedition from 29th October to the 16th November:—

1842	Time.	BAROMETER.		THERMOMETER. °F		REMARKS.
		Bunten's mm.	Attached Thermometer. °C.	Dry Bulb.	Wet Bulb.	
29 Oct.	3 p.m.	678.30	21.3	70	66.5	Fine.
	6 p.m.	678.51	21.7	70.5	65.3	,,
30 ,,	6 a.m.	678 30	17 1	63	60.5	Roraima clouded: Rainfall 0,38 in
	7 ,,	678.88	18.6	66	62,7	Fine.
	8 ,,	679.42	21.7	71.3	66.5	Roraima clouded.
	9 ,,	681.85	25	77.5	70.5	,, clear.
	10 ,,	680.20	27.5	82	72.5	,, partly clouded.
	11 ,,	680.45	29.8	85.6	75.3	,, clouded.
	12 ,,	680.10	30.2	86.5	73.7	,, ,,
	1 p.m.	679.20	24.5	75	67.7	Rain.
	2 ,,	679.00	23.7	74	67.5	Drizzle.
	3 ,,	678.20	22.8	73.3	67.1	Roraima clear. Mist over our [village.
	4 ,,	678.55	25	77.5	70.5	Thunderstorm.
1 Nov.	9 a.m.	679.71	23.6	74.3	67.5	Wind N.E.
	10 ,,	679.90	25.5	77.5	69.2	,, E. to N.
	11 ,,	679.94	27.2	80	70	,, E. to N. R. clouded.
	12 ,,	680.00	28.2	83	71.5	,, E. to S. ,, ,,
	1 p.m.	679.86	29.2	83.9	73.5	,, ,, R. partly clouded.
	2 ,,	679 30	28.7	83.1	70.5	,, ,, R. clouded.
	3 ,,	679.28	28	81.7	70	,, E. to N. Thunderstorm.
	4 ,,	679.05	25.7	78	69	,, E. in E.S.E. ,,
	5 ,,	679.40	25.5	77.4	69.2	,, N.E. Thunderst. in S.W.
2	6 a.m.	678.85	18.1	64.5	61 8	Fine. Roraima clouded.
	7 ,,	679.35	20	68.2	64.5	,, ,,
	8 ,,	679.79	23·2	73.8	66.3	,, Wind E.
	9 ,,	680·10	25.6	77.6	68	Squalls E N.E. R. clouded.
	10 ,,	680.00	26.5	79.9	67 6	Fine. Wind S.E. R.partly ,,
	11 ,,	680.20	27.6	81.8	69.5	,, ,, ,,
	12 ,,	680.46	28.7	83	70	Wind S.S.E.
	1 p.m.	680.12	29.3	84.2	70.3	,, ,, R. thickly clouded.
	2 ,,	680.12	28.9	83.7	73	E.S.E, ,, ,, ,,
	3 ,,	679.80	28.2	80.7	70.2	,, S.E. Rain showers.
	4 ,,	679.34	24.3	74.7	69.3	Wind N.N·W. Clouds. R. clear.
	5 ,,	679.20	25.7	77.5	68.5	,, E.N.E. Thunderst. in s.s.w.
	6 ,,	679.45	25.7	77.3	68.5	,, W. Clear.
	7 ,,	679.70	23.3	73.2	67.5	,, W. Clear.
	8 ,,	679.90	22.5	72.5	66.3	,, E.
	9 ,,	679.76	22	71	65.3	,, E.
	10 ,,	679.66	21.8	70	65	,, W.
	11 ,,	680.05	21.5	69.3	64.6	,, W.
	12 ,,	679.70	20.7	68	64.2	Clear.
3 ? ,,	1 a.m.	679.75	19.5	66.5	63.5	,,
	2 ,,	679.70	19	65.2	63	,,
	3 ,,	679.50	18	64	61.7	,,
	4 ,,	679.49	18.3	64.3	61.5	,,
	5 ,,	679.45	17.5	63	60.3	Clouds. Roraima clear.
	6 ,,	679.36	16.8	62.4	59,8	Wind N.E.
	9 ,,	680.00	22	72.5	65.5	,, S.S.E. Fine. Few clouds.
	12 ,,	680.38	28.3	82.3	69.3	Fine. Few Clouds.
	3 p.m.	680.93	29.9	85.3	69.3	Heavy clouds in N.N.E.
	6 ,,	679.87	26.8	79.7	68	Fine. Clear.
5 ,,	6 a m.	678.85	14.7	58	56.3	,, ,, Roraima also.
	9 ,,	680.00	22.7	72	65.5	Fine. Light wind from N.E.
	12 ,,	680.66	29.8	83	68.8	Light wind from S.E.
	3 p.m.	680.60	29.6	83.5	69.7	Strong wind.
	6 ,,	679.97	25.2	76.5	66.3	E. Completely clouded.
6 ,,	6 a.m.	679.30	16,3	61	59.6	Clear. Fine. Roraima clear.
	9 ,,	680.48	24	74	67	Fine. Wind N.W,
	12 ,,	680.70	29.3	83.4	69 4	Light wind.
	3 p.m.	680.55	29.8	84.3	72	Fine. Roraima clear.
	6 ,,	680.24	26.2	82.7	67.3	Strong wind from N.E.



MOUNTAINS RORAIMA AND KUKENAM.

		BAROMETER.		THERMOMETER.		REMARKS.
1842.	Time.	Bunten's mm.	Attached Thermometer. °C.	Dry Bulb. °F	Wet Bulb.	
8 Nov.	6 a.m.	679.30	18	63 7	62.2	Fine. Calm. } Away from place of observation.
	6 p.m.	680.48	24.4	74.3	69	Wind S.E.
9 ,,	6 a.m.	680.53	17.7	63.5	61.2	
	6 p.m.	679.95	25.3	75	66.3	
10 ,,	6 a.m.	679.78	18	65	62	
	9 ,,	680.57	26.2	77.5	67.5	
	10 ,,	680.92	27.5	80	67.7	
	4 p.m.	680.30	27.7	80.3	70	
	5 ,,	680.00	26	77.5	69 3	
	6 ,,	680.00	25	75.5	68	
11 ,,	6 a.m.	679.70	19.3	66	64.3	Cloudy. Rainbow at Sunrise.
	7 ,,	679.70	20.2	67.5	64.2	
	12 ,,	681.70	31,2	82	70	
	3 p.m.	680.55	26.8	78.5	69.2	Wind E.N.E.
	5 ,,	680.20	21.5	69.5	66	Drizzle.
	6 ,,	680.50	21.2	69.2	65.5	Wind W. Cloudy.
12 ,,	6 a.m.	680.80	19.8	66.5	63.7	Rain 0.05 in. Cloudy.
	9 ,,	681.15	22.8	71.6	67	
13 ,,	6 a.m.	680.42	19	65.8	63 5	
	9 ,,	681.75	25.8	77.5	68.5	
	12 ,,	681.50	27.7	80.3	71.6	
	3 p.m.	680.50	29 6	84	72	
	6 ,,	680.50	21.2	69	65.3	
14 ,,	6 a.m.	680.68	19.4	66	64	Rain 0.23 in. Cloudy.
	9 ,,	682.30	21.8	70.5	67.3	Calm. Cloudy.
	12 ,,	681.62	24.8	75.5	69.3	Wind N.
	3 p.m.	680.59	26	77	69.3	Wind E. to N.
15 ,,	6 a.m.	680.60	18.6	65	62.5	Rain 0.02 in.
	9 ,,	681.19	22.7	72	67	Fine. Clear.
	12 ,,	681.34	23.5	72.8	69	Cloudy.
	3 p.m.	680.34	22.9	72	68.2	,,
	6 ,,	680.40	20.8	69	65.5	,,
16 ,,	6 a.m.	680.43	17	62	60	Heavy rain 3.35 in. Wind E.S.E.
	7 ,,	680.67	18 5	64.5	62.4	Cloudy. Calm.
	8 ,,	681.18	20.5	68	64.5	,, ,,
	9 ,,	681.28	21,7	70	65.7	,, ,,
	10 ,,	681.30	23.2	72.5	67	Wind S.W.
	11 ,,	681.45	24.5	75.1	68	,, N.E. Cloudy.
	12 ,,	681.35	25.2	76.3	68.5	Calm. Cloudy.
	1 p.m.	680.88	26.3	79.8	69.5	

Mean of the meteorological observations at Our Village.

	Total.	÷ No. of observations.	= Average.
Barometer... ...	68,691.19	÷ 101	= 680.10 mm.
Attached Thermometer	2,297.3	÷ 101	= 22.7 °C
Dry-bulb ,,	7,392.7	÷ 101	= 73.1 °F
Wet-bulb	6,662.7	÷ 101	= 66.06 °F

441. However keen we were on climbing Roraima, we had to postpone the execution of our wishes until the return of our messenger from the Serekongs, because from what the Indians told us, there were no animals or fruits up there to appease our hunger. During the interval, my brother started his trigonometrical measurements while I rambled round the neighbourhood for a zoological and botanical harvest. The former was miserable enough, the whole of the surrounding country proving itself just as destitute of mammals and birds as the mountain tracts that we had already passed. But I was compensated so much the more by the fulness of the prevailing vegetation. The mountain slopes, the banks of the torrents and streams, the forest oases showed a multiplicity of shape, genus and species as had never offered itself to my eyes and hands before. Compared with this richness of soil, the scarcity of animal life seemed all the more striking. Here and there a solitary Aguti, still more rarely a Laba, or a troop of the *Mycetes* already mentioned, a species of *Cebus* never before seen, then that rat-like creature soon to be brought to us alive in plenty, and in which we thought we recognised *Cavia leucopyga*, and now and again an ant-eater (*Myrmecophaga tetradactyla*) or a proboscidean (*Nasua*): as regards birds, *Penelope*, more rarely *Rhamphastos*, but on the other hand plenty of *Euphone*, *Tanagra*, *Pipra* and *Nectarinia* amongst which the green and black spotted dainty-looking *Tanagra punctata* Linn., the glossy seven-colour *T. Tatao* Linn., the red-headed *Pipra cornuta* Spix and *P. serena* Linn. were especially prominent, the large owl (*Strix torquata* Daud.), and a Rail (*Crex Schomburgkii* Cab.) the size of a sparrow were the sole representatives of the higher classes of the animal kingdom. The last-mentioned, a new species of rail, were always found together in pairs: the forehead is rust-red, the wings dark-brown, having their upper surfaces decorated with small white spots which begin at the back of the head as quite small densely crowded little dots, increase in size and then spread over the entire back and wing-covers: the throat is white, the breast a rusty red, the body whitish, the legs on the other hand having a yellowish colour. The pretty creatures are very easily caught because their powers of flight only carry them a short distance, when they try and hide in the grass. A cock and hen of mine lived fairly long in a cage until the former got away and the latter died next day from grief. The number of berry-bearing trees, especially of the families *Laurineae* and *Sapindaceae* that were found here, might well condition the presence of *Penelope*. The *Penelope* is an extremely cautious and shy bird, that one can only get to shoot during feeding-time when six to ten will always collect upon a tree. If the hunter manages to sneak up to them, he will kill three or four with his blow-gun before the others take notice and flight: the bird that has been hit by the noiseless arrow falls from off the bough without disturbing the others that are feeding beyond making them look with long-stretched necks down after it and search shyly around for the cause. If they discover this, they hasten with extraordinary swiftness from bough to branch to the thickly leaved top and hide themselves here, or else fly thence from tree to tree. They build their nest on the ground: as soon as the young can fly but a little, they lead them from bush to bush until they

can reach the branches of a tree. Except at daybreak, one never hears their very peculiar rattling note. The flesh of the older birds can only be chewed and enjoyed when they have been killed with urari poison which renders it quite delicate and tender.

442. The *Cebus* mentioned above differs not only in size, but also in its longer hair from *Cebus capucinus* and *apella*: it might be almost taken for the *capucinus*. The dorsal surface of its body and of the extremities with the exception of the shoulders and upper arms that are straw yellow is of a dark olive colour: on the skull is to be seen a black three cornered spot which in front is sharply defined and is continued to the root of the snout, and behind is lost in the dark colouring of the nape of the neck: the scanty hairs on the dorsal surface are walnut-coloured, and pale golden yellow towards the tail-tip which, however, is black. Forehead, cheeks and throat are walnut yellow, hairy, and the face blackish. The ventral surface of the body is coloured similarly to the upper, except that on account of the thinner hair, it appears somewhat lighter. Hands and feet, like the inner sides of the forearms and legs are black. The tail, which is thick and long-haired, is longer than head and trunk taken together; its dorsal surface tallies with the colour of the dorsum of the body, the ventral surface and the tip on the other hand being black. The male exceeds the female not only in size but particularly also in the hair of the tail being considerably longer. The trunk and head of a full grown female measures 16, her tail 18½, and hind-limbs 10½ Paris inches.

443. No genus of monkey shows more variation in size, colour, and growth of hair than does the genus *Cebus*, in consequence of which a number of new species have been called into existence that are really nothing more than varieties that have arisen through the mixing of *C. capucinus* with *C. apella*. I have never met a troup of *C. capucinus* without finding some specimens of *C. apella* in it. This continual association of the two species seems to have brought about a mixture from which have arisen the very many differences relative to hair and colouring that have puzzled the zoologists. It is only in the Canuku Ranges that I can call to mind having met troops of monkeys that consisted solely of *Cebus apella*: their haunts seem generally limited to particular localities because, except in the Ranges just mentioned, I have only seen them on the coast and then always among *C. capucinus* with which the neat little *Callithrix sciurea* had also often associated itself. I invariably found *Mycetes*, *Ateles*, *Pithecia* and *Hapale* absolutely separate from one another, and even among *Pithecia leucocephala* never a specimen of *Pithecia chiropotes*.

444. But however easily one could fall into error in the identification of a *Cebus* by mistaking a mere variety for a new species, it nevertheless seemed that the size, the long hair, and its very restricted area of distribution in which I had never noted the ordinary *Cebus capucinus* and *apella*, together with the fact of the Macusis having no knowledge of the animal, vindicated the statement that in it I had found a new species to which the name *Cebus olivaceus* Schomb. might well be applied: it is never met below 3,000 feet. The *Cebus* are pets of the Indians and thus one finds

them very frequently tamed by them: it was this that gave me the opportunity for learning the large number of varieties in the genus. With these remarks I am still including a few in connection with the new *Nasua* I discovered here, which has suffered a strange fate in its identification. Its colouring was so striking and differed so essentially from the many varieties of *Nasua socialis* hitherto observed, that we immediately took it for a new species, but unfortunately possessing too few natural-history books to confirm our suspicions, forwarded it to Berlin with the next consignment, undescribed. I was accordingly all the more surprised to find that very same *Nasua* determined as *N. vittata* by von Tschudi in his "Untersuchung über die Fauna Peruana." The specimen was shewn him on its arrival and he, recognising it as new, took the required notes, and before it was yet described in Berlin, published it in his Fauna Peruana, although it does not occur there.

445. In its manner of living it does not differ much from *Nasua socialis*: it feeds on fruits, insects, young birds, and searches for its food by day, but is only seldom met with. The Arekunas maintained that in any case the animal was rare. It was quite unknown to our Macusis: it seemed for this reason to be limited only to certain localities. Herr von Tschudi in the above-named Fauna, etc., describes it as follows:—The snout, head and nape are quite black: a broad black band runs from the latter between the shoulders to the middle of the back: the limbs are black, the back is yellow-brown, somewhat darker towards the root of the tail, the belly is reddish-brown: the tail is considerably shorter than the body, and has transverse bands which quite disappear towards the tip.

446. The complete absence of wild animals within so elevated a district as that occuped by the Arekunas, is really also the reason why this tribe when hunting, only requires a blow-gun, a weapon with which they can skilfully strike a target 150-180 ft. high up. I have already mentioned that the Indian very much prefers to increase his live-stock through the young still suckling litter for which his wife acts the part of mother. I was witness here of the way in which the Arekunas know how to tame an obstinate old monkey. Supposing they want to keep such an one alive, they smear the arrow with weakened poison so as to make the creature lose consciousness, and if under these circumstances it falls off the tree, they immediately suck the wound, bury it up to its neck in the ground, and pour into it a strong solution of nitrous earth, or, in the absence of this, some sugar-cane juice. When consciousness returns it is taken out of its grave and tightly bound up with palm-leaves like a little infant in its swathing band, and any movement on its part rendered impossible. It is left lying in this straight-jacket for some days: cane-juice is its drink and meats boiled in salt-petre water and strongly seasoned with capsicum are its food. If these forcible measures do not answer, they hang it in the smoke, still bound up, with every outbreak of temper: its unbridled fury is soon spent, the hitherto maliciously wrathful eyes become gentle, and it cries for release. The bands are loosened, the remembrance of the past with all its ways has disappeared, and the oldest and most savage monkey has become as tame as if it had never roamed the forests. According to Professor Pöppig,

the Indians on the banks of the Huallaga adopt the same procedure when they wish to break in an old monkey.

447. As to the little guinea-pig (*Cavia leucopyga*) already mentioned (sect. 441), six to eight living specimens would often be brought to us but without our being able to keep them alive: the Indians' statement that they could never by any manner of means be tamed, was confirmed. Had we ten or twelve together, none would be alive after the third day. They live in holes out of which they are driven by pouring water in, and then easily caught. The pelt has a dark grey colour, the belly is whitish: the forefeet are short, three inches in length, the hind feet somewhat longer. The female has only two teats in close proximity to the genitals. Its silky-like fur is attached so delicately to the skin that even the slightest touch of the hand knocks it off and leaves a bare space.

448. I have already stated how very poor the rivers were as regards fish, but the valleys and river banks harboured snakes all the more: rattle-snakes from 4 to 6 ft. long were brought in. On one of my botanical excursions I myself came across a large Coulacanara (*Boa constrictor*) that might have resulted in unpleasant effects on my person had not the sharp eyes of my young companion Misseyarai, the Macusi, observed it before my disturbing it in the dense thicket of tree-ferns (*Mertensia*) bordering a forest oasis to which we were making our way. The noise of our footsteps may have attracted its attention, for with its head raised above the closely-set shrubs it had probably been watching us absolutely motionless for quite some minutes before Misseyarai perceived and pointed it out to me. Had I seen the thing before, I would have taken it for the extremity of some thin upstanding branch. We were without any weapons, and "Our Village" was too far away to fetch any from there before sundown. Nevertheless in spite of Misseyarai's remonstrances and fright as well as the repugnance of the dog that followed us, my mind was quickly made up to attempt at least to kill the animal, and a thick cudgel for hitting it was soon found. When Misseyarai saw that I was not to be dissuaded from my purpose, he drew back from the probable field of battle: the dog, with tail between its legs, went and squatted down beside him and watched my movements just as attentively as did its friend. While the reptile still held its head stiff and rigid above the bushes, I cautiously drew near so as to get within reach and give it a smashing blow with my club: but just at the very moment that I was about to do so, the creature disappeared under the green covering, the peculiarly swift movements of the fern fronds indicating the direcion that it had taken. The denseness of the thicket prevented my getting in, but its movements showed me the course followed by the snake, which again soon approached the edge, along which I hurried to keep it in line. The winding movements in the tree-ferns suddenly came to a stop and the creature's head burst through the thick covering of leaves, probably to have a look round at its pursuer. A fortunate blow struck it so forcibly that it sank back senseless: but lest it should come to life again, the cudgelling was several times repeated. Like the

hawk on a pigeon, I threw myself on my prey, knelt on it, and gripping its neck with both hands, managed to strangle it. On Misseyarai seeing that the real danger was over, he hurried up when I called, loosened one of my braces, made a sling of it and passed it over my hands on to the creature's neck where it was drawn as taut as possible. The closeness with which the trees were set, again and again prevented the powerful beast doing a twist, and made it easier for us to prove our superiority, but it was only when we finally dragged the animal into the open that I recognised for the first time what a monster I had been engaged in fighting. It measured 12¼ feet and was of immense girth. Although I had met the *Boa murina* up to a length of 26 feet, it never had such a girth as in the *Coulacanara* with a length of from 8 to 10 ft. Exerting our greatest efforts and care not to damage the skin, we towed the heavy brute to the village which we reached dripping with perspiration. It being already too late in the day to skin it, I reserved this business for next day, but as past experience in connection with the vitality of snakes had taught me to be careful, my braces were replaced by a stronger sling that I tied to the house-posts.

449. Loud and immoderate laughter together with a peculiar hissing sound woke me in the morning out of my sleep. I hastily jumped out of the hammock and went outside the door. The snake had really revived and was making terrible efforts to free itself. A whole circle of Indians had collected around and were trying to increase its rage and fury by teasing it.. With gaping jaws it uttered its uncanny note, something like the hissing of a goose, while its eyes seemed to want to burst out of their orbits with passion: the tongue was in continual motion.. If anyone drew close during the hissing, a musk-like smell was noticeable. To put an end to its troubles as quickly as possible, I shot the brute in the head: its beautiful skin was unfortunately lost subsequently.

450. Amongst insects an innumerable quantity of *Cicadae* especially attracted our attention owing to their ringing up their shrill concert regularly every day at noon and 6 o'clock evening. A choir of a thousand voices then sounded from under the green leaves of the trees and bushes, but it was hardly pleasant to the ear. At the same time as the evening concert, a bird, which in spite of every effort on our part was never to be seen, could always be heard striking a shrill piping note that had the greatest resemblance to the whistle of a locomotive. The creatures commenced their noise with the punctuality of a clock, the opening of the concert varying at most from 2 to 3 minutes. Other animals also let their voices be heard at other definite times, so that one can tell the time of day even without a watch, without it being necessary for the sun to be visible. Daybreak and sunset are thus heralded by parrots with a piercing shriek as they come every morning at the same hour from out of the higher forests to settle on the lower lands where they bring the day to a close, and as they return to roost just as punctually and regularly shortly before sundown. Linnæus, proposed making a clock of flowers, but the tropics possess a much surer and more accurate one of animals. Large numbers

of the curious *Prionus ccrvicornus* and a quantity of beautiful *Buprestis* were present amongst the insects.

451. The poorer the results of my zoological excursions, the richer was I compensated by the flora. The heights of the neighbouring mountains and the little streams were mostly covered with the most beautiful plant forms.* The summits and slopes of the mountains surrounding us, the banks and beds of the rivers, showed throughout a variegated sandstone of very brittle quality which spread partly in horizontal layers, partly with a dip from South to East. Here and there in the river-beds there also appeared horizontal strata of a pebbly thick red sandstone, upon which there rested a jasper rubble of all sizes and colours: even the red jasper that I saw at Rué-imeru Fall, was found in it. I counted seven different colours, besides yet another pretty variegated banded kind which in its colouring corresponded exactly with Siberian jasper and upon our return was regarded as such. Isolated pieces of jasper as large as one's fist lay around upon the savannah: they were used by the Indians as flint-stones, and assiduously collected by our Macusis. Large beds of clay containing a rich pebbly-earth, weathered jasper and felspar stretched through the savannah itself.

452. The rich fairy-like wealth of vegetation and wildly romantic mountain massif often formed valleys which were overwhelmed with a loveliness that held even the Indians, less susceptible to the beauties of nature, spellbound. The discovery of a new Paradise always formed a most enjoyable break in the journey during my botanical excursions. I shall never forget the charming surprise I got one day while botanising on the wooded base of Erematuru when I stood unexpectedly at the entrance of a deep gorge down which a small torrent, in a hundred cascades was scurrying to the Kukenam. Thick beds of a deep red sandstone came into view on the bottom of the stream as well as on both sides of the valley wall to form, here perpendicular precipices, and there terrace-like steps which were stocked with high grasses, luxuriant clusters of bambu and tree-ferns: slender palms either raised their proud heads above the latter, or bent them over the noisy cataract. The isolated rocky boulders, that emerged above the water were thickly covered with moss, small delicate ferns, and *Jungermanniae,* while tree-ferns, *Diksonia, Cyathea* and *Alsophila* hung from the walls of the ravine over the cleft in every nook and formed the most fascinating foliage-covering that fancy could create. It was through this mysterious gloom—for the sunshine sought in vain to pierce the wealth of vegetation and enjoy the pleasures of the cooling stream—that the sparkling water babbled, rustled and splashed away with its alluring song, the notes of which were only silenced when, on reaching the valley of the Kukenam, it finally ended its life-story. Huge trees with their straight smooth stately

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* I mention but *Kielmeycra angustifolia*, *Bonnetia sessilis*, *Ternströmia rubicunda*, *T. punctata* Sw., *Clethra guianensis* Klotzsch *Isertia hypoleuca* Benth., *Ocotea guianensis* Aubl., *Gomphia dura*, *Qualea rosea*, *Vochysia guianensis*, *V. tetraphylla*, *V. Schomburgkiana* Klotzsch, *Rhopala suaveolens*, *R. Schomburgkii*, Klotzsch., *Andripetalum sessilifolia* Klotzsch, *Calophyllum lucidum* Benth., *Dimorphandra macrostachya*, *Clusia insignis*, *C. roseu*, *C. microcarpa*, *C. macropoda*, Klotzsch. *Caraipa laxiflora* Benth., *C. leiantha* Benth., *Guatteria elongata* Benth., *Calycophyllum coccineum* Benth., *Rondeletia capitata*, *Sabeicea velutina* Benth., *Psychotria hyptoides* Benth.

columnar trunks crowned the top of the ravine. I felt just as much overcome with the sublimity and peace that was diffused over this lovely little spot as if I had stepped into some spacious and venerable Gothic building.

453. The Indians whom we had sent to Torong-Yauwise to fetch our belongings returned a few days before our departure for Roraima: after being amply rewarded for their honesty and services rendered, they went back to their settlement the following morning. Just as this circumstance afforded us a fresh proof of the blameless honesty and probity of these people, so next day we were to learn how easily the susceptibilities of these children of nature can be wounded. Amongst our Macusis were three villagers from Nappi who, when occasion offered, were among the most cunning in shirking work, a failing for which they had already been several times called to account. To finish our labours expeditiously, all hands were requisitioned again to-day, with the result that everybody hurried up, and set to work, except our three lazy-bones who remained quiet in their hammocks. My brother sent for them, but in vain: now he went himself and demanded their assistance: but this produced no other result than a shaking of the head and their continuing as they were. Irritated at this behaviour, and bearing in mind the salutary effects that had followed a similar coup-de-main for laziness amongst the carriers on his first journey, he took his cutlass and cut the hammock ropes that were tied to a tree of all three whereby the dilatory fellows were quickly brought from the ground to their feet. Calmly and masterfully controlling their fury, they now obeyed his orders and carried out their duties without a murmur:—but next morning they were gone without leaving a trace, their susceptibilities being wounded to the very depths. Without provisions, without receiving any payment whatsoever for their services, they had started on their return journey to Nappi during the night: they had rather suffer hunger, trouble and hardship than remain longer with those who had made a laughing-stock of them.

454. The long-desired Serekongs also arrived at our place on the following day. They entered our village headed by their chief, a venerable old man with long snow-white hair. In spite of his wrinkled skin and great age, which was more particularly noticeable in the emaciated figure than in the colour of his hair—for up till now I had only noted this peculiarity in one individual, and had never seen baldheadedness even amongst the oldest Indians—curiosity had nevertheless induced the grey-headed old gentleman to undertake the lengthy and laborious journey to see the Paranaghieris. The men had their long hair combed nicely backwards, and plaited into a long pig-tail which gave them quite a Chinese appearance. Except for this fashion of dressing the hair and the more peculiar characters in which the body was painted, they corresponded in physical conformation with the Macusis and Arekunas: this was also the case with the women, several of whom were accompanied by their children whom they brought to us soon after arrival so that we might breathe upon their faces and bodies, and so restore them back to health. Strangely enough, as among the Orientals, the breath is re-

garded by them as an outlet of the inmost strength of soul and spirit. Our persons, instruments, and tools were naturally objects of their extreme astonishment and wonder: beyond everything else, this was the case in regard to forks, and as soon as they saw us using them at table, they burst into loud mocking laughter, shook their heads sarcastically, and showed us their fingers which they seemed to consider the most unrivalled articles in comparison. However great the hopes we had set upon the supplies expected from them, we nevertheless found ourselves much disappointed, and were accordingly obliged to leave for Roraima as quickly as possible.

455. Accompanied by some twenty Indians we made a start on 17th November at daybreak in the best of spirits in open-mouthed expectation of what the next few days would bring us, never for a moment dreaming that even the very first one was to be so sadly embittered. Crossing at the outset an oasis of glorious *Clusia, Styrax* and *Laurus* trees that extended to the western border of the Kukenam, we met an open rolling plain: we continued to traverse this all the time along the right bank of the river which here formed a large picturesque waterfall of several cascades that gave rise to a thunderous noise. Ahead of us to the northward above a piece of rising ground, that had pushed itself in the way and obstructed the view of the real base of Roraima, were to be seen the giant ramparts both of this mountain and of Kukenam which, being free of all mist to-day, were glittering in the morning sun, while out of the north-west the Murre shot into the Kukenam over a mighty sandstone wall above which a beautiful *Leguminosa* bent itself in full bloom. Before crossing the Murre, the Indians drew our attention to a large sandstone boulder with picture-writing, on the upper surface of which we noticed several curved lines about 1/8 in. deep, that looked exactly as if some one had drawn both his hands in a curve over the stone, and left the impression behind. "While Makunaima still wandered on the earth," he came over here and left this for the generations following him as a sign of his presence." When I asked one of our guides from Pirara who this Makunaima really was, he answered without hesitation "Jesus Christ."

456. Once on the other side of the Murre we took a more northwesterly course over an undulating savannah and soon came to another little stream about 10 ft. broad that was also hurrying to the Kukenam and crossed our path. In the middle of its bed lay a large block of sandstone which had already served as a stepping-stone to those ahead in the file of Indians who, springing on to it from this bank, jumped from off it onto the opposite one, a manoeuvre which all those following repeated. I was sixteenth in the row, and immediately behind me was Kate, the young buckeen who, as mentioned (Sec. 290), had been married to her husband shortly before her departure from Pirara, and who on account of her bright, friendly and merry ways, qualities which one only very rarely finds among Guiana's fairer sex, had obtained permission to keep her husband company. She was the pet of the whole party. As I was making my way to the stream, some *Schultesia* bordering its edge attracted my attention, and to make sure whether they had already been

collected, I watched them a moment before taking the jump when Kate, impatient and smiling, passed the remark that I needn't stop still on account of that little flower and keep all the others behind waiting. With a laugh I took a run and sprang onto the stone and was about to take the second jump when a heart-rending shriek from Kate pulled me up short, and Awacaipu*, the Indian immediately following her, made a clean spring across the water with a terrible cry of "Akuy, Akuy! (Poison snake)." This happened to be the very moment of my turning round at Kate who, deadly pale, now stood close beside me on the boulder, pointing to the bank from which she had just jumped with the same cry of "Akuy." Just as I was enquiring with some feeling of consternation whether she had been bitten, she burst into tears, when at the same moment I noticed several drops of blood on her right leg close to the knee. Only a poisonous snake could have caused such a wound, and solely the speediest help could save the poor girl's life. It was bad luck that Mr. Fryer with my brother were last in the long line, while the Indian with the medicine chest and lancets was among the first. In the absence of any other bandage, I immediately pulled off my braces, bound them above the wound as tightly as I could, and instantly got the Indians to suck it. I believe the unfortunate woman was at first unaware that she had been struck at all, although the snake had sprung at her twice and had bitten her once above and a second time beneath the hand-broad strings of bead that was wound around her leg below the knee. The running and racing drew upon us the attention of those that followed, among them her husband, who all rushed up. However much the sight of his beloved wife affected him, he nevertheless had to hide his feelings in his inmost heart. Deathly pale, he got close down beside her and sucked the blood. While these efforts were being made, the boy with the medicine chest, my brother and Mr. Fryer came up: the latter scarified the bite, while the other Indians, squatting on their heels and outwardly apathetic, looked on and took it in turns to suck the wound. The sight of this circle of apparently indifferent faces with their bloody lips was something awful. Although we immediately applied spirits of ammonia both externally and internally, our exertions were in vain, and in the course of three minutes all the normal signs of poisoning had set in:—powerful convulsions seized the entire frame, the face became more and more pale and corpse-like, and the body was soon covered with a cold perspiration, the poor patient complaining more of the terrible pains along the whole side of the lamed leg and in the neighbourhood of the heart and back, than in the wounded spot. The free movement of the foot became limited, spasmodic vomiting set in, which quickly turned into blood, the eyes were also suffused with a hemorrhage that soon oozed out of the ears and nose: the pulse beat was quite 120 to 130. In another eight minutes our pet was no longer recognisable in her sufferings, the poor creature having already lost her speech with the commencement of the blood-vomit. During this interval the Indians had killed the snake which was found lying a few inches from the path. Unless she herself had interfered with it, I had probably disturbed the reptile when I jumped upon the rock, and it had now darted at Kate, who was following me. When the Indians discovered it, it had already rolled itself into a spiral, with its expectant head erect, ready for another spring, which sufficiently contradicts the statement that it seeks flight after each bite. It was the very poisonous *Trigonocephalus atrox* which was just then changing its skin, a period during which all poisonous snakes are believed to be far more dangerous than at others. The Indians called it Sororaima. Fourteen Indians and Mr. Goodall had already passed by without noticing it, without treading on it. Kate was the victim. Accompanied by Mr. Fryer and her husband, who even yet exerted all his strength of mind to hide his grief, the unfortunate young woman, already in an unconscious condition, was carried back in her hammock to Our Village which she had left so merrily and happily. The look that we once more took of her was the last—this was only too well recognised by every one of us.

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* This man subsequently became the master-spirit in the tragedy at Ibirima-yeng when 400 people, adults and children, mutually sacrificed themselves with the idea of coming back to life as Europeans. The story is told by Appun. (Ed.)

457. The feelings with which the journey was resumed by all of us in general, and by myself in particular who, on account of my close proximity to the danger, must ever take the blame for being the innocent cause of the fatality, can be better imagined than described. A long time passed before a sound could be heard in our taciturn company, for even in the hearts of the Indians the recent occurrence left no room for thoughts of anything else.

458. After half an hour's march we again stood on the banks of the Kukenam which we had to cross. The water came up to our chests, and every effort had to be exerted to prevent ourselves being carried away by the raging torrent, against which even the dogs when swimming could not contend. Its source lay still another five miles ahead of us, and yet the river had a breadth of from 50 to 60 feet. Once on the other side, we followed awhile the eastern bank, which was occupied here and there by neat brush-wood thickets of *Ternströmia*, a new species of *Tovomita*, *Tovomita* (*Micranthera*) *ligulata* Klotzsch, *Gomphia*, the stately *Dimorphandra* overtopping everything else, even including the slender *Mauritia*, and a number of other plants as yet unknown to me. We found ourselves at a height of 3,600 feet above sea-level, but the glorious palm still shewed the same vigour and luxuriance as in the savannahs of the Rupununi and Takutu. After some time we left the eastern bank, turned towards the North, scaled a little table-land, and in front of us rose the remarkable mountain system in the whole of its imposing majesty, without the base being hidden as before by the protruding hills. Isolated dark green plots in wider or narrower streaks stretched from the base up the body of the mountain, where scraggy rocky ridges were to be seen, which at about three-fourths of its height were replaced by patches of forest that had specially chosen a home in the ravines and gorges, as well as along the sides of the torrents pouring down them. A thick bushy scrub enclosed the perpendicular ascending wall, so as to make the latter look as if it were growing out of the dense foliage. I gazed for a long while on this imposing mass of rock, which at such a

distance one takes for basalt rather than for sandstone. With Roraima there stood before me the watershed of the three large river areas of Guiana, that of the Amazon, the Orinoco, and the Essequibo. My brother had already once touched upon and examined the mountain-range, and hence I propose including here an abstract of his experiences "The Parima Range divides the plains of the lower Orinoco from those of the Rio Negro and the mighty Amazon, and extends, according to Alexander von Humboldt, the first to make us acquainted with this surface configuration of Guiana, between 3° and 8° lat. N. and 60° to 67° long. W. The system extends from 85° N. to West up to the banks of the Rio Negro and Rio Branco over an area of 225,000 square miles. If the shape and disposition of its parts is regarded strictly from a geographical point of view, the term Cordillera cannot by any means be applied to it, because it is formed not so much of one continuous chain, but far rather of a regular group of isolated mountains divided from one another by plains and savannahs, a granitic cluster the like of which, compared with its extent, indeed only a few are known in either hemisphere. The copious beds of gneiss and masses of metamorphic rocks indicate clearly and undoubtedly that the whole mountain-range owes its origin to fire. As has already been noted in many another large range, the highest points of elevation are likewise to be found, not at its centre, but at its spurs, in fact in the most southerly and northerly of its mountains: over there it is Marawaca and Duida in the neighbourhood of the Orinoco, here it is Roraima. Marawaca rises 8,219 ft.,* Roraima 8,000 ft. above sea-level. Closely associated with the Parima mountain-chain is the isolated broken-away Pacaraima or Pacarinha Range of our more recent maps. I have travelled this wildly-romantic mountain-system throughout its entire length from the banks of the Corentyn to those of the Orinoco, over more than nine degrees of longitude, and although it is in very large measure broken up by a number of plains and valleys, it nevertheless forms an uninterrupted mass of granite extending from 59° long. as far as the latter river's remarkable bifurcation. Whereas its eastern portion, the Parima Range (collectively taken) is broken through by the Corentyn and Essequibo, the Pacaraima system forms towards the westward the water-shed of the three large basins of the northern portion of South America, the Amazon, Orinoco and Essequibo.

459. The most characteristic things about this mountain chain are without doubt those sandstone walls which were first of all met with on the banks of the Cuyuni in 6° 45′ lat. N. and 61° long. W., again appeared on the Mazaruni, and reached their culminating point at Roraima in 5° lat. N. and 61° long. W. While crossing the Pacaraima Range on my

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* My brother in his travels did not get into the immediate neighbourhood of Marawaca and could not therefore give any exact measurement. In his account to the Geographical Society of London he says:. "The mean of 7 observations gave me the situation of my stopping-place as 3° 47′ lat. N. and accordingly Mt. Marawaca, the highest of the group, is in 3°40′, and the lonely Kurianiheri with its pyramidal top 3°38′. The mountainous surroundings and the thick forests prevented my determining its height from a base line. The mountain, however, must be certainly from 10,000 to 11,000 feet above sea level." As my brother's statement is not based upon actual measurement I have taken the height as given by Codazzi.

first journey, I came across the same mountain massif between the 4th and 5th parallels of latitude, and between the 64th and 66th meridians, and convinced myself finally that not only Marawaca, but Duida also, belonged to the same formation. The direction of its greater axis runs consequently for the first two degrees of latitude with the meridian and then runs 350 miles towards W.S.W. It is an interesting fact that these remarkable mountains which towards their summits consist of wall-like precipices from 1,400 to 1,500 ft. high exactly fix the watershed between the rivers which flow N. to the Orinoco, S. to the Amazon, and E. to the Essequibo. This is the case with Roraima, the mountains of the Pacaraima, as well as Mts. Merewari and Tapiraperu: even Mt. Vindaua, in the neighbourhood of the culminating point of the small mountain-range, which cuts through the first and second parallels, consists of sandstone and forms the watershed of the Takutu which finally streams into the Amazon, and into the western tributaries of the Essequibo. Vindaua, so far as is known, is the most southerly of the wall-like sandstone mountains. Metamorphic rocks, e.g., jasper exactly corresponding with the Siberian, and rock crystal, are found in its environs."

460. I consider it necessary to introduce these short geognostic notes before passing on to the description of the most peculiar members of the group, Roraima and the rest. The range is formed, as stated above, of an immense sandstone chain which consists far rather of isolated elevated and disconnected heights than of a single blended massif: Roraima, Kukenam, Ayang-catsibang and Marima form almost a quadrilateral figure of which Roraima, the eastern side, is not only the highest but also at the same time the most easterly point. Their greatest extent between Roraima and the western end of the Irutipu amounts to 25 miles. The eastern extremity of Roraima lies in 5° 9′ 40″ lat. N. and 60° 57′ long. W., rises 5,100 ft. over the tableland and 8,000 ft. above sea-level. The very top consists of bare, in some places 1,500 ft. high apparently perpendicular crags of sandstone to which formation the base also belongs, and for the benefit of the reader I cannot sketch any more speaking likeness of these extraordinary shapes than refer him to their miniature replicas in the Königstein and Lilienstein of Saxon Switzerland.

461. North-west of Roraima, Kukenam rises with a similar rampart-like summit running out in spurs, and so also does the Ayang- catsibang: Marima is on the north. The quadrangle formed by these four mountains occupies from S.E. to N.W. a superficial area of 10 geographical miles. The eastern extremity of Roraima has a striking resemblance to a huge gate-way. The N.W. portion of Ayang-catsibang lies in 5° 18′ lat. N. Two miles N.W. of it another sandstone height, the Irwarkaruima rises to a height of 3,600 feet above the tableland. On its eastern slope lies a huge somewhat urn-shaped sandstone boulder 466 ft. high, at its widest part 381 ft. in circumference, standing as it were upon a pedestal 3,135 ft. high. Closely connected with it is the Wayaka-piapa, the "felled tree," which, according to Indian tradition, the good spirit Makunaima cut down on his journey overland and changed into stone to leave behind as a memento of his wanderings among the human race: it very much resembles an obelisk.

Mts. Yaruaramo [Yaruaruima], Irutipu, Carauringtipu, of which the last raises its head 4,943 ft. over the tableland, complete this remarkable group.

462. Innumerable water-falls rush in continual procession down from the flat summits, and the most brilliant description will always remain but a shadow to the truly imposing sublime Reality, with the thundering and foaming cataracts, with the wonderfully enchanting tropical vegetation at their base. The Cotinga flows with tumultuous rapidity from the eastern side of Roraima and carries its waters down to the greatest stream of all, the Amazon, by means of the Takutu, Rio Branco and Rio Negro. The Cuya [Cucuya], a tributary of the Cako, which joining the Mazaruni, flows into the Essequibo, has scoured out its bed in the sandstone precipice somewhat more to the northward of the Cotinga channel. Some streams on the south-westerly side, amongst which the Kamaiba* is the most conspicuous, hasten on to the Kukenam.

463. The River Kukenam itself streams out from Roraima's next door neighbour, and after its junction with the Yuruani forms the Caroni, a tributary of the Orinoco. But the Yuruani, which the Indians take for the main stream of the Caroni, sallies down the northern side of Kukenam in innumerable rills and on the western wall of the valley picks up a number of other small rivulets which bicker down the Ayang-catsibang, Zarangtipu, and Irwarkaruima and other smaller heights of the group. The Araparu hurries blindly over the wall-like rampart of Marima in many a small torrent while the Cako, one of the largest tributaries of the upper Mazaruni, rises in the group of hills on the eastern side of Irutipu, and the Cama rushes down its western side to flow into the Apauwanga, a tributary of the Caroni. What immense bodies of water must be thundering over these steep precipitous heights can be judged from the number of rivers arising on the platform, a cause for the mountain group having been rightly described as the "ever fruitful mother of the torrents." One might almost search in vain for such an interesting geognostic phenomenon anywhere else. I gazed in dumb amazement at the mass of mountain with its sparkling bands of water spreading itself out before me, until it became suddenly enveloped in an envious veil of mist. The circumstance of thick forests extending from its northern extremity to the Atlantic coast, while boundless savannahs spread along its southern side might without doubt be the chief reason for this constant humidity, as well as the rain and almost daily thunderstorms of these regions.

464. We now quickly strode over the still intervening undulating ground intersected by a number of small tributaries of the Kukenam which were bordered by a vegetation quite strange to me. In their close proximity the latter showed its usual tropical luxuriance and vigour: at a distance on the other hand, the clusters of bush were strikingly poor. With eyes continually directed on Roraima and taking but scanty notice of anything else in front and close by, we finally reached the base of the

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* Written Kamaiwa, [in C. Clementi's "A Journey to Mt. Roraima, etc." [Timehr June, 1917.

mountain itself and started to climb it, over one of the flats devoid of forest, between huge sandstone boulders of the most fantastic shapes. The higher we got, the more beautiful and surprising was the vegetation of the soil and surrounding blocks of sandstone which latter, wherever earth had collected in their clefts, had been specially selected as their habitat by peculiar plant-forms with strong leather-like leaves: these included *Clusiae, Mimosae, Myrica, Gaultheria* and *Thibaudia,* whilst a rank growth of the small delicate *Meisneria cordifolia* Benth. was present in between the rocky crevices. *Agaves, Cactus, Gesneriae,* mosses, and lichens decked the sides bare of all earth. We had not yet reached half way up the base of the stone-wall, when suddenly those thick clouds of mist, which hitherto had only invested the summit, sank continually lower and lower until they soon enveloped us with the result that we could hardly see six to eight steps ahead. The mist quickly developed into a cloud-burst, the water of which, in the course of 1½ hours, amounted to several inches. The continuation of the ascent was out of the question. Shivering with cold, exposed to the violent downpour of rain, we tried to pitch our tents as quickly as possible, and then to satisfy our urgent craving for warmth by fire which we only succeeded in lighting after several vain attempts on account of all the timber we found being wet. Once lighted, we squatted around the miserable flame with teeth still chattering in spite of the irritating smoke that rose from the whizzing wetted wood. The rain and mist lasted until the evening close. The thermometer recorded 58° F. The poor naked Indians who found no room under the tent cover, hastened to a thickly timbered ravine, and spent the raw night there. Our sleep was also several times broken by the cold, a sensation to which we had become strangers. It affected us much more than it would have done under a temperature of 54° Fahr. in a northern climate.

465. The earnestly longed-for morning broke at last, and with the warmth of the sun our teeth very soon stopped chattering. Inspirited with the heat, we continued our ascent between gloriously flourishing brushwood which, in the fusion of millions of rain and dew drops, glittered up against the rocky massif glowing in the fairy-like illumination of early sunrise. Though our climb up the path that had become slippery with the heavy rain was double as hard as compared with yesterday, not one of us minded the exertion, because the vegetation at every step became more interesting: every forward move brought me a new plant, never seen before: yes, indeed, even in the space of a hundred yards the various plant-zones would change. Sprouting out from all the clefts and crevices of the huge sandstone strata were *Ladenbergia, Cosmibuena,* as 2 to 3 ft. high shrubs, and the most charming orchids among which I need only note the small sedge-like species already found on my ascent of the Humirida, together with the glorious *Cattleya, Oncidium, Odontoglossum* and *Maxillaria.* About a hundred feet above these were to be seen all varieties of the beautiful *Sobralia Elisabethae* with its 6 to 8 ft. high flower-stalks in such thick quantities that we had to cut a way through with our cutlasses. I had never before seen such a multiplicity of plant forms as showed itself upon every block of rock

that was covered with dainty moss, *Octoblepharum albidum,* and lichens, *Usnea australis* Fl., *Cladonia rangiferina C. coccinea,* and *C. carnea.* On the height of expectation as to what the next moment was going to reveal, we clambered over the sharp, pointed and angular blocks of rock, and went on, until a cry of astonishment due to some new discovery brought those who were scurrying along to a temporary standstill. I must admit that I was absolutely flabbergasted for the first few hours in this botanical paradise: it took some minutes before I could collect my thoughts or think about things. Sometimes the path lay along the tops of steep ravines wherein foam-sprayed streams were pouring down into the bottom of the valley between regular forests of ferns which had crowded out every other plant. Again, though the trees might not reach the height of their brothers in the valley, their tops nevertheless made a show of bloom that was almost unknown to the latter. Amidst the ostentatious bright yellow of the *Gomphia* and *Vochysia,* and the dazzling white of the *Qualea,* one could hardly find the simple whitish-yellow flowers of the *Ladenbergia,* of which the greatest portion of the trees consisted. The trail soon led to a forest, the edges of which consisted solely of flowering shrubs in all imaginable tints of colour, to which *Vochysia tetraphylla, Gomphia dura* Klotzsch, the brilliant blooms of *Befaria, Gaultheria, Archytaea, Tibouchina, Hirtella* and *Rhynchanthera* mainly contributed. Isolated trees of the neat-looking *Weinmannia ovalis* Pav., with its delicate light-green leaves and decking of white blossoms, rendered themselves conspicuous both near and far. What with all this lovely and charming alternation we had almost reached the zone of the brushwood surrounding the mountain up to its perpendicular walls when we came upon a small swampy flat, where Flora had gathered her most delicate, her loveliest offspring, upon which her enchanting beauty had reached its zenith. The whole level was covered with the dark blue of the *Utricularia Humboldtii* Schomb., the most beautiful species of the genus with its 3 to 4 ft. high reddish, delicate flower-stalks from which 3 to 4 large deep blue flowers often hung. While one glimpsed in astonishment over this fairy carpet one's gaze was unexpectedly fixed on the equally interesting *Heliamphora nutans* with its peculiar light-green ribbed tubular leaves in between which rose the equally delicate flower-stalks with their white, often also red-tinged flowers. But high above these frail plants rose the flowers of the glorious *Cypripedium Lindleyanum* Schomb., the beautiful *Cleistes,* and the yellow blossoms of certain *Rapateae* amongst which mention may be made of the beautiful *Saxo-Fridericia Regalis* Schomb., and the equally new genus *Stegilepis* Klotzsch, *Stegilepis guianensis.* I thought I saw a Cycad standing in the midst of this medley of strange growths: a jump or two over the swampy ground brought me to my imaginary discovery, in which I recognised but a fern with large up-standing fronds which varied only slightly from the leaves of *Cycas.* It belonged to the genus *Lomaria,* was new, and ended by being *Lomaria Schomburgkii* Klotzsch. My eyes were dazzled with the splendour of the fresh greens, with the intensity of colour of the flowers and legumes predominating on this flat, while my senses were dulled by the lovely perfumes with which they scented the air: I believed myself transported to some fairy garden, for such a blending of colour, such a multiplicity combined within so small a space, had been a surprise to me until to-day. The border of the brushwood that enclosed this botanical El Dorado, consisted of the glorious *Thibaudia nutans* Klotzsch, a new and beautiful species, the young rose-red leaves and half-red, half-white flowers of which, in conjunction with the yellow sweet-scented blossoms of the Root-parasite, *Loranthus Tagua* H.B.K., the beautiful *Melastoma*, the big-bloomed delicate trees of the *Tabebouia triphylla* DeC. and the tree-ferns, formed a garland around which again a number of creepers slung themselves in fantastic tangles, or joined to form a thick fence. As I now looked up at the giant sandstone wall mounting above me to a height of 1,500 feet, and at the many water-falls that rushed over its summit down the precipice, my mind gave me to shout, but I felt so small and insignificant in front of the imposing massif, a description of which I hardly dare commence on account of my pen being unequal to the task of expressing in language the sensations and sentiments that became nascent in me. There were too many objects that unexpectedly offered themselves to my gaze: I recognized nothing definite and it became impossible for me to devote more than momentary attention to one and the same plant: indeed at last I could not even find words to express my feelings, though my heart rejoiced in a transport of delight, and all the hitherto experienced troubles of the past, even the fears of the future, came to an end with the overjoyed present. Unable to collect any plants I hurried back to the others, who were busy opening out the tent-cover in between jagged and pointed rocks covered with lichen, moss and fern close by this little Paradise: our object was to remain here until the trigonometrical bearings were completed, and the wealth of vegetation as far as possible harvested.

466. We found ourselves 6,000 ft. above sea-level in 5° 9′ lat. N. and 60° 57′ long. W.: the height to the top of Roraima from the camp was still 2,000 ft., according to a trigonometrical measurement. The meteorological instruments, for starting observations from to-day, were soon set up, and except for the somewhat unpleasant cold, we felt neither oppression nor difficulty in breathing; what was more, the biting insects of the low lands had completely disappeared. A view of the valley was still denied us owing to a thick sea of mist that had already covered it before our present elevation had been reached. After pitching our tents and arranging all the other things, the naked and shivering Indians built their little huts in between the rocky boulders and lighted big fires around which they squatted, or else to which, lying in their hammocks, they drew their feet up as closely as possible.

467. Towards seven o'clock in the evening the mist turned into a pouring rain accompanied by a violent wind-storm. It was an awful uproar with which the raging storm drove the rain with frightful force into our tent, wetted us right through, and made our teeth chatter afresh. The thermometer stood at 58° F. The fire could not allay the effects of the cutting wind. After lasting an hour the raging storm abated, the clouds parted, the sky again became bright and clear, and the moon and

stars in the heavenly blue lighted up a scene the detailed description of which even the most vivid imagination would attempt in vain. Sparkling in the magic sheen of the moonlight, the masses of water, now swollen into torrents, shot down from the flat-topped summit with a terrible thundering din. Roraima blustered as if hundreds of steam-engines were on the go: Kukenam roared as if the sea, after bursting its former limits, was wallowing over the firmament and burying everything beneath. The moon and stars cast their pale silvery light in quiet calm upon the unshackled bodies of water breaking away in white foam and, like bursting billows, flinging their spray over the brushwood, upon the dark colossus in our proximity, and upon the deep black ravine that separates it from Kukenam, but which they could not illumine. The Kamaiba, barely wide in the afternoon, now rushed down as a 20 to 30 ft. broad torrent, but the degree of delight that arrested our whole attention was yet to be increased still further when one of the most beautiful lunar rainbows that I had ever witnessed suddenly made its appearance.

468. Chattering with cold, I woke up between 4 and 5 o'clock on the morning of 20th November. The thermometer was 52° F. Sleep was not to be thought of on account of the "shivers," and we thanked God that we were able, at break of day, to warm our stiffened limbs, which the fire was unable to do, by exercising them. The uproar of last night that had so aroused our emotions, as well as the waterfalls, had resumed their normal—what we had heard and seen appeared to have been a dream. According to the traditions of the Indians, the plateaus on the summit are covered with immense lakes abounding in all kinds of fish, especially dolphins, with huge white eagles like everlasting sentries continually circling around. Daybreak unfolded a new charm to our astonished gaze. Roraima and Kukenam, like the other higher peaks, were completely free of cloud and glistened in the stillness of the warming sunshine, but deep below us a thick white mist hid the whole of the surroundings like a thick covering of snow which was gilded and coloured with the most remarkable changes of light consequent on the extreme refraction of the sun already risen. We had south on the heights, north in the depths. The contrast between the luxuriant vegetation around and above us, between the mighty sandstone massif with its glittering waterfalls and sombre red walls was surprising. Alexander von Humboldt says that in the Alps one searches in vain for a 1,600 foot high perpendicular rock: the well-known Staubbach in the Swiss Alps rushes over a 900 ft. high rocky wall and the still more celebrated Cascade de Gavarnie, the highest waterfall yet known, is also but 1,266 feet. The Kamaiba, however, rolled 1,500 ft. down the southern side in front of us. Now and again a bush-like vegetation had firmly attached itself to the precipitous walls, and from where we were, looked like blurred masses of green which contrasted strongly with the reddish rock. The surface-top of Roraima must be somewhat raised at the centre because a few bushy spots could be recognised there. After the Kamaiba had taken its awful plunge of 1,500 feet and had disappeared in the fresh green of the brushwood surrounding the base, it suddenly emerged again on a spot devoid of all vegetation, and then rushed headlong again over

a 120 ft. high steep wall, to hide itself again in the dense foliage. This fairy-like scene, however, was not to last for long. The mist began to lift: it rose out of the depths in the shape of long-stretched clouds which were quickly driven before the wind over the greater part of the surrounding country and soon greedily wrapped us and the high crags once more in the damp and chilly veil that we could not pierce.

469. After taking our morning soup, which consisted of yams and water, I rambled over the slope of the range in all directions, and at almost every step discovered new treasures, each find giving rise to a fresh cry of delight that hardly ever ceased. The huge sandstone boulders that were piled in disorder over the declivity also supplied me with the most beautiful and peculiar Flora. A regular confusion of *Clusia, Thibaudia, Mimosa, Myrcia, Ternströmia, Bonnetia, Befaria, Vaccinium, Gualtheria, Gomphia* and *Stegilepis guianensis* had made themselves at home here, while the huge notched needles consisting of compact pebbly white and red sandstone that came into view in between, were covered with lichens, such as *Cladonia, Evernia, Usnea* and mosses, e.g., *Sphagnum, Octoblepharum, Calymperes, Hypnum,* amongst which flourished the dainty *Gnaphalium americanum.*

470. Wherever the eyes might turn they encountered the most beautiful orchids, e.g., *Stelis ophioglossoides* Sw., *Diothonia imbricata* Lindl., *Zygopetalum Mackai* Hook., *Masdevallia guianensis* Lindl., *Cleistes rosea* Lindl., *Oncidium pulchellum, Cattleya pumila* Hook., as well as *C. Mossiae* Hook., *Odontoglossae, Maxillariae,* and a numerous quantity of *Epidendrons.* But the *Sobraliae* remained the most lovely jewels which at this height reached a state of luxuriance that might seem fabulous to the northern gardener: wherever any humus had collected in the clefts and crannies of the boulders, or the beds of sandstone were but covered with somewhat lighter vegetable mould, these darted out with their 8 to 10 ft. high shoots and their flowers from the size of our garden lily upwards, and formed a regular tangle through which we had to cut our way with a cutlass. The reason why the *Sobraliae* bloom so rarely in our orchid-houses may well be that they are usually supplied with much too warm a temperature. 69° F. was the highest and 52° F. the lowest temperature of the localities where they flourished in most profusion: that of the water in the torrents was 55° to 58° F. The tables of meteorological observations during our stay at Roraima show the degree of heat under which not only the orchids but all the peculiar plant-forms in general flourished in a state of luxuriance that was hardly discoverable anywhere on the lower levels. Judging from these experiences it seems to me that complaints will continue to be received concerning their scanty blossoms so long as our orchid culture is not approximated more strictly and positively to the temperature limits proper to the plants. If we step nowadays into an orchid house we find all the forms possessed by the owner exposed to one and the same temperature: the degree of heat is the same, and the moisture also. Were one to pay a little more attention to the hints suggested here, I am quite convinced that the beautiful *Sobralia* would soon develop its enchanting blossoms also with us.

471. The vegetation hedging the streams and waters that were babbling, dancing and slipping away to the plains, consisted almost generally of the plant forms already mentioned, with which, still among the *Melastomaceae*, *Rhynchanterae*, and *Microliciae*, a beautiful *Melastomacea* had associated itself. The lovely prettily-shaped tree often 20 to 30 ft. high which mostly took up its quarters in regular clusters on the edge of the brushwood, formed without doubt the most delightful decoration of this fairy garden. Its large white 2 in. diameter flowers possess the peculiarity that on their opening they are tinged with the most delicate rosy red, which, with the advancing day gradually becomes paler and paler, until by evening it is changed into the purest white: a peculiarity possessed by the *Victoria Regia* in inverse proportion. The magnificent ground orchid, *Cleistes rosea* Lindl. with its big red flowers, in between the *Utricularia*, *Heliamphora*, *Cypripedium*, *Stegilepis* and the beautiful fern *Lomaria Schomburgkii* increased the charm of this enchanting paradise many times more. But where to find words, if I wished to describe here the impression produced by the innumerable flowering plants which succeeded one another in uninterrupted series to the base of the mountain. Roraima represents everything that Africa, Australia, and the South of Europe are able to offer. Amongst this huge number of elegant and varied plants that covered the slope of Roraima, the genus *Befaria*, owing to the beautiful colour of its flowers, makes itself particularly noticeable. It is indisputably one of the loveliest representatives of the sandstone region. It appeared first of all at an absolute height of 3,000 ft. and extends up to 6,000 ft. where the pretty shrub however no longer shows the luxuriance and size that it exhibits at the lower level. On the Humirida Ranges where this interesting genus first came under my notice, it seemed to have reached its greatest perfection: there the bushes reached a height of 8 to 10 feet, while here on the slopes of Roraima one of only 4 to 6 ft. Its favourite localities appear to be sunny sandy mountain slopes. This beautiful genus is now being imported through Dr. Karsten from Colombia, and will later on certainly become one of the greatest ornaments of our hot-houses.* I wanted to make my way into the brushwood but the attempt failed, no human body being able to penetrate such a confused network of ferns and *Scitamineae*, interlaced with trees the boughs of which at this height branched from the trunks immediately above the ground: the trunks were closely pressed up against one another.

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* Briefly speaking, the following are the main floral representatives of Roraima:—*Rondeletia capitata* Benth., *Chiococca nitida* Benth., *Perama humiles* Benth., *Echites angustifolia* Benth., *E. subcarnosa* Benth., *Waltheria viscosissima* St. Hil., *Vernonia dichocarpha* Less., *V. ehretifolia* Benth., *V. tricholepis* DeC., *Eupatorium scabrum* Linn. fil., *Lipochaeta scaberrima* Benth., *Spilanthes Poeppigii* DeC., *Calea divaricata* Benth., *Achyrocline flaccida* Benth., *Gnaphalium americanum* Mill., *Leria nutans* DeC., *Hyptis membranacea* Benth., *H. simplex* St. Hil., *Marsypianthes hyptoides* Mart., *Ormosia coccinea* Jack., *Dimorphandra macrostachya* Benth., *Hirtella scabra* Benth., *Chaetogastra gracilis* DeC., *C. hypericoides* DeC., *C. divaricata* DeC., *C. glomerata* Mart., *Macairea rigida* Benth., *M. parvifolia* Benth., *Microlicia myrtoidea* Chamss., *M. taxifolia* Benth., *Rhynchanthera monodynama* DeC., *Diplochita Fothergilla* DeC., *D. parviflora* Benth.. *Tococa cristata* Benth., *T. Roraimae* Benth., *Henriettea succosa* DeC., *Clidemia capitata* Benth., *C. spicata* DeC., *C. pustulata* DeC., *C. rariflora* Benth., *C. radulaefolia* Benth., *C. desmantha* Benth., *Miconia alata* DeC., *M. nitens* Benth., *M. revoluta* Benth., *Myrcia*

472. So far as the fauna was concerned, the mountain was equally as poor as in the valley. Only some few small birds of the genus *Fringilla* and *Trochilus*, *Trochilus Anais* Less., a new species of the genus *Diglossa*, *Diglossa major* Cab., together with *Arremon personatus* Cab. sp. nov. which slips extraordinarily swiftly through the low bush and eagerly searches every leaf for the few insects located there, were the representatives that I found: otherwise, everything was still and except for the dull boom of the waterfalls, not a noise disturbed the deep silence.

473. The number of plants that I and my companions had managed to collect within a short while forced me to return to the camp and press them at once: this was unfortunately more easily said than done, because the papers on being taken away from the fire would immediately become so damp with the moist atmosphere that drying was not to be thought of, even were the sheets to be changed several times a day. The moisture at this height was so great that Mr. Goodall exerted his stiffened hands in vain to transfer Roraima to wet drawing paper. In spite of the greatest care, the astronomical instruments were nevertheless covered with rust: a loaded weapon left standing for a few hours would not fire owing to the powder having already changed into a greasy mass. It was too disheartening. Soon after returning from my excursion, Mr. Fryer arrived with the news that poor Kate had died at 4 o'clock in the morning, consequently 63 hours after the accident. The blood-vomiting had increased more and more and continued up to the time of her death. Up to the very last her foot remained swollen into a shapeless mass, nor did she recover consciousness again: gangrene supervening, had put an end to her misery. Judging from the very violent cramps and convulsions, the poor creature must have suffered terribly, but not a sob, not a sound passed her lips. Immediately after death all the women of the village had collected in the house and shouted unintelligible words into the corpse's ears, while Mr. Fryer, during the preparations for burial, at once took the road for Roraima to catch us up where possible. The news of our dear pet's death, although it hardly came as a surprise, nevertheless spread a sense of sadness over our little circle. While Mr. Fryer was giving us the latest particulars of the death, my eyes fell upon a dead rattle-snake lying in front of the tent, of which my brother or Hendrick might have become the victim when carrying out their trigonometrical measurements: both had avoided this fate by a bold spring. The safer we had deemed ourselves to be from these creatures at this height, the more unpleasant did now the certainty become that their actual habitat was in this rough and damp atmosphere. I always experi-

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subcordata DeC., *M. ferruginea* DeC., *Utricularia Humboldtii* Schomb., *Heliamphora nutans* Benth., *Cypripedium Lindleyanum* Schomb., *Leiothamnus Elisabethae* Schomb., *Encholirium Augustae* Schomb., *Gomphia dura* Klotzsch., *Ternströmia rubicunda* Klotzsch., *T. punctata* Sw., *Weinmannia ovalis* Pav., *W. guianensis* Klotzsch., *Vaccinium puberulum* Klotzsch., *Gaultheria cordifolia* Humb. Bonp. Kth., *Thibaudia nutans* Klotzsch., *Isertia hypoleuca* Benth., *Clusia cucullata* Klotzsch., *C. alba* Linn., *C. macropoda* Klotzsch., *Rhopala Schomburgkii* Klotzsch., *Befaria Schomburgkiana* Klotzsch., *B. grandiflora* Humb. Bonp. Kth., *B. guianensis* Klotzsch., *Bonnetia sessilis* Benth., *Archytaea multiflora* Benth., *Stegilepis guianensis* Klotzsch., and *Saxo-Fridericia Regalis* Schomb.

enced a certain sense of satisfaction on killing one of these poisonous animals, because on such occasions the thought ever recurred that with its death I had saved the life of one of my fellow creatures.

474. We anxiously awaited the late afternoon for the return of our hunters who had left this morning with the dogs in the direction of the valley, to follow the fresh tracks of a tapir that had been found yesterday: they returned home late in the evening but unfortunately as empty-handed as they had set out, the quarry not having shown itself. They also told us that two of their party had only saved themselves by a jump from the bite of a rattlesnake, several of which had been come across during the trip. Our previous carelessness had consequently to be put aside.

475. Since yesterday we had sent four of our Indians on ahead to cut at least a practical path through the brushwood up to the base of the wall. This was done, and while yet twilight on the following morning, in company with two of them, I followed the troublesome track which ran up the mountain between two walls of vegetation. I can hardly call to mind such a tangle of thickets, trees, ferns and creepers. Tree stood on tree, their limbs closely locked: mosses, lichens, *Jungermannias* and ferns covered the tree trunks, the shrubs, and ragged crags that either emerged above the ground or else were scattered around as huge fragmentary masses. Everything trickled with moisture, just as if the clouds had burst into a sudden downpour. The laboriously won path led us over the sepulchre of countless plants: the moisture had turned everything into a slush in which we often sank up to our knees: now it went over small stretches of trees torn up by the gale, the mouldering trunks of which were so slippery with lichens and moss that I slid off at almost every step and then fell in up to my armpits between the branches and stems, whence my companions had to pull me out: now and again it passed over jagged and decomposing rocks: then over the often foot-deep already decayed and yet still decaying masses of foliage and shrub that were covered with mushrooms and ferns. Wherever, as the result of one of those breaks in the forest, the rays of light could supply warmth to the huge black, dark-green, slippery boulders, and but a little humus had collected on their surface, there the *Arum, Anthurium, Bromelia, Heliconiae, Peperomiae,* and tree-ferns struggled for existence.

476. Though we had followed the tiresome and unfamiliar track for quite an hour, had swung ourselves up the rocky cliffs by means of dependent roots and creepers, and had let ourselves down again by their aid into deep declivities, I had not as yet seen the mighty stone colossus, and consequently did not know how much further we had to go. Just then a large carmine-red flower attracted my attention from amidst this forest-shaded labyrinth, and in delightful surprise I hastened to admire it at close quarters. The lovely blossoms were borne on a low plant with pale green branches, the leaves of which were opposite, long-petioled, dull green, glabrous, tapering at both ends, and complete. The flowers were without scent but instead of that were of unusual beauty with the carmine-red tray-shaped corolla (*präsentirtellerförmiger Blumenkrone*) having a milk-white centre radiating to the free edges of

the petals. It was a new *Gentianea* and indeed a new species of the rare genus *Leiothamnus* which, with every right, one can call the Queen of this family. Her Majesty the Queen of Prussia has graciously allowed me to name this beautiful species *Leiothamnus Elisabethae.*[*]

477. I might have climbed quite another 100 ft. higher subsequent to this botanical find, as the forest became somewhat lighter, and the hitherto closely-packed trees, mostly *Cinchonas* and *Melastomaceae* began to separate, when my eyes fell upon another unknown blossom in the dense underwood occupying the intervening spaces: it was a *Bromeliacea*, .indeed a new species of the genus *Encholirium.* Its short cylindrical peduncle was surrounded with clasping, lanceolate stiletto-like, bright green leaves, from 6 to 9 in. long: the peduncle is an extension of the stem, pencils off towards its tip to the size of a goose-quill, and is thickly embraced by bracts: the upper bracts are brown, bearing flowers in their axils: the flowers themselves are in pairs or in threes in the axils of the sheath-like bracts compressed into a compact cone-like spike: the three outer sepals are uniform, keeled, brown, and somewhat spreading at their free edges: the inner ones are foliaceous, brown violet in colour and free as far as their bases. Her Royal Highness, the Princess of Prussia, has graciously permitted me to call this charming *Encholirium, Encholirium Augustae.*[†] The environs now again assumed the delightful character that is so peculiar to tree-ferns, every single plant being enabled to unfold its light and graceful fronds without hindrance from its neighbour. Ferns and only ferns formed the brushwood: I had never yet seen so many wonderful and lovely shapes collected in one spot.[‡] Amongst them I also discovered a glorious *Utricularia* which flourished very gaily amidst the moss of the tree trunks. The whole of the little specimen was about 1½ in. high, the delicate oval leaves had a bright green, and the blossoms, uncommonly large in proportion with the size of the plant, a bright red colouring. Unfortunately this dainty species still remains unidentified because on my return to camp I was attacked with violent fever, from which the largest number of our carriers were suffering ever since yesterday, and the Indian boy whose business it was to put away the treasures brought back by me had thrown away the pretty little

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[*] —The foot-notes containing the technical descriptions, in Latin, of this particular plant together with that of the Encholirium Augustae (Sect. 477) are omitted. (Ed.)

[†] —See foot-note to Sect. 476

[‡] —The following are only some of the ferns of Roraima :—*Aneimia humilis* Sw. *Schizaea dichotoma* Sw., *Hymenostachys elegans* Presl., *Trichomanes brachypus* Kze., *T. Ankersii* Hook., *T. cellulosum* Klotzsch., *T. rigidum* Sw., *T. Prieurii* Kze., *Hymenophyllum clavatum* Sw., *Mertensia longipinnata* Hook., *M. pubescens* Willd., *Cyathea hirtula* Mart., *C. pungens* Kaulf., *C. marginalis* Klotzsch., *Lindsaya pumila* Klotzsch., *L. dubia* Spreng., *L. rigescens* Willd., *L. tenuis* Klotzsch., *L. filiformis* Hook., *Adiantum triangulatum* Kaulf., *A. glaucescens* Klotzsch., *A. tomentosum* Klotzsch., *A. hirtum* Klotzsch., *Lomaria Schomburgkii* Klotzsch. *L. Plumieri* Desv., *Xiphopteris serrulata* Kaulf., *Aspidium cicutarium* Kz., *A. coriaceum* Sw., *A. mexicanum* Presl., *Polypodium cultratum* Willd., *P. euchlorum* Kze., *P. apiculatum* Kze., *P. nervosum* Klotzsch., *P. brevipes* Kze. *P. Richardii* Klotzsch. *P. lepidopteris* Kze., *P. Pavonianum* Klotzsch. *P. areolatum* Humb. Bonp., *Pteris litobrochioides* Klotzsch., *P. deflexa* Link., *P. bifornis* Splitg., *Salpiglaena volubilis* I. Sm., *Asplenium Serra* Langd., *A. integerrimum* Spreng., *A. auritum* Sw., *A. alloeoptera* Kze., *A. Schomburgkianum* Klotzsch., *A. cuneatum* Lam. Of the *Lycopodineae* I collected *Lycopodium robustum* Klotzsch, *L. carolinianum* Linn., *L. Jussiaei* Desv., *L. linifolium* Linn., *Sclaginella Breynii* Spr., and *S. puberula* Klotzsch.

plant, the absence of which I was naturally the first to notice, but only when too late to remedy the loss.

478. Ever increasing numbers of massive boulders, in between which we had to wind our way, led me to conclude that I was drawing near the rocky wall. The hitherto light and airy surroundings disappeared, and I found myself once more in verdant shade. The higher we climbed, and the closer we tried to make our way to it, the thicker became the vegetation. We had to climb up over boulders, down into gulleys, which always made me wonder, so soon as I had a look back, how we had managed to make the ascent. We had thus once more scaled a rough mass of rock, when the dense vegetation lightened, and the 1,500 ft. high sandstone colossus rose in front of me. The summit, according to a trigonometrical measurement, is 5,000 ft. above the tableland. Fresh wonder seized me as I looked up at the gigantic wall, the top of which projected a bit, and overcome with a peculiar oppressive, I might almost say distressing, sensation, my heart began to beat as violently as if I were being threatened with some danger opposed to which my pygmean strength sank into insignificance. As I gazed at its giddy height, the rocky massif appeared wild and awful: huge boulders that must have torn themselves loose from the summit or the sides were strewn around in hellish disorder, while the splintered and shattered remnants of what once were trees stood boldly out in between them. The sublimity, the transcendancy implied in the immensity of this wonder of nature, the sense of my own unimportance, and then the ever-recurring thought that the overhanging summit was about to fall and bury me under its crushing weight—all these must have combined to produce the abovementioned distressing sensation that otherwise was quite foreign to me. A number of flowering orchids, *Bromeliaceae* with large scarlet-red blossoms, ferns with delicate fronds waving gracefully in the breeze, small bushes with yellow and white flowers, as well as creepers with a complete covering of blossom, flourished on the soakingly wet rocky wall, fluttered and swayed to and fro and ridiculed and quizzed me from the precipitous crag: they tossed themselves about as if conscious of being beyond my destructive reach, and at every swing disappointed the hope in which I had indulged of seeing this one or that one, dislodged by the breeze, falling at my foot. What botanical treasures must be contained on those steep walls. How many must be hidden on their tops. And yet they were more secure from adventurous ascent than the interior of the earth itself.* The cliffs were com-

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* Mount Roraima, since these days, has been repeatedly climbed, especially by foreign scientists, among whom Koch-Grünberg was one of the earliest to describe it under its proper name of Roroima. The claim to the first ascent was made by H. I. Perkins and E. im Thurn in 1884. There is reason to believe that the path followed to the base of the cliff up to the waterfall was more or less one of the re-opened tracks originally cut by the Indians who were collecting birds for Henry Whitely, whose grave is still pointed out to visitors at Annai. As regards the climb itself, Mr. Perkins says that " it was in no place difficult, nor I think dangerous, but very dirty, wet, and stony—I have always thought that other people failed to get to the top because they had not sufficient provisions to enable them to stay long enough in the place to cut the track, and try their luck, and they therefore turned back." The party which accompanied the Editor in July, 1914, started from Tewonno one morning before dawn, reached the summit, and were back at the village the same evening after dark. The mountain was again climbed, two years later, by the Hon. C. Clementi and his wife (*Through British Guiana to the Summit of Roraima*, London 1920), who was thus the first white woman to have scaled this interesting landmark. (Ed.)

posed of a solid fine-grained reddish sandstone with small white thin plates of mica. A species of *Rubus* probably the only species of the tropics, the sweet berries of which proved a real cordial for us, flourished at their base. A small delicate *Melastomacea* with sulphur-yellow blossoms sprouted in the clefts of the steep rocks, as well as in the crannies and projections, wherever any humus had collected: on closer investigation it proved to be a new species of *Cambessedesia,* to which I could apply no more characteristic name than *Roraimae,* because I never found this peculiar plant anywhere else but on this mountain.

479. Unfortunately the forest, by reaching up to the very base of the mountain, just like the wild thicket of ferns, allowed us to take but isolated and stray views of the landscape spread out below. The sense of oppression first began gradually to disappear as I retraced my steps downwards, but I only breathed freely when I found myself outside the area of the precipitous wall. Our descent was attended with infinitely more difficulties than the climb up. Had I taken a mud bath I could not have arrived in camp dirtier than I really did.

480. Immediately after getting back, when I rolled into my hammock with a very bad attack of fever, my brother and Mr. Fryer started along the path just traversed by me. The huntsmen, in no sense disheartened by yesterday's bad luck in missing the tapir, had again set out this morning in a happy frame of mind and now returned in the evening crowned with victory. Not a bit of meat having passed our lips for ten days, all and sundry fell with ravenous hunger upon the dainty repast while the wretched fever had completely spoilt my otherwise excellent appetite.

481. On the following morning, 22nd November, we intended leaving this spot, so interesting from both botanical and geological points of view. On account of his mapping, my brother was forced to push his way up to the source of the Cotinga, which rushes down the eastern precipice of Roraima, while anxiety to prevent my treasures getting mildewed urged me back to Our Village as speedily as possible so as to be able to dry them before this dangerous condition should be really reached: to press them here was an impossibility.

482. Nevertheless during this short stay I had collected over 100 species of Phanerogams, and 83 species of fern, amongst which a large number proved to be new, and yet we had reached this inexhaustible botanical treasure-house in the same month wherein my brother had visited it in the year 1838. What a countless number of plants had already bloomed, how many near blossoming, or still awaited it! I have never and nowhere again even approximately, seen such a similarly lovely wealth of vegetation as that which greeted me on this sandstone range where one was in doubt which to admire the more—the infinite variety or the enchanting loveliness of the flowers. The most insignificant alteration in the lay of the ground, the varying height and dip of the beds, however slight it might be, differing degrees of moisture, every one of these conditions, or one in combination with the other, gave rise to such a change in vegetation as would never be found over a similar limited area throughout the almost level lands of the Essequibo, Orinoco

and Amazon streams. I had but one wish and that was to stay here a whole year: I am firmly convinced that every week, every month would have disclosed an infinitely wide and inexhaustibly rich field for my activities. My limited resources, however, shouted an imperious "Forward" and I had to say good-bye to this botanical El Dorado for ever.

483. I must include here the hourly meteorological observations which may perhaps prove of value to many an orchid-grower by giving him an interesting wrinkle or two about the prosperous cultivation of his foreign protégés.

METEOROLOGICAL OBSERVATIONS IN OUR CAMP AT RORAIMA.

		BAROMETER.		THERMOMETER.		REMARKS.
1842	Time.	Bunten's (mm.)	Attached Thermometer. (°C.)	(°F.) Dry Bulb.	Wet Bulb.	
18 Nov.	9 a.m.	619.55	17.5	62.3	61	Cloudy.
	10 ,,	619.65	17.2	63	62	Cloudy. Sunshine on base of mountain.
	11 ,,	620.00	17.5	63.3	61.5	Rain Shower.
	12 ,,	618.91	19.8	67.2	66	Clouds.
	1 p.m.	618.24	20.3	67.5	64.5	Ror. and Kuk. partly clear,
	2 ,,	617.70	19	67	63.5	Ror. partly clear; Kuk. clouded.
	3 ,,	617.48	19	65.7	63	
	4 ,,	617.20	17	61.5	61.5	
	5 ,,	617.23	16.4	60.5	60.5	
	6 ,,	617.38	15.7	59.5	60	Ror. partly clouded; Kuk. thickly clouded.
	7 ,,	617.95	15.5	58.7	58	Strong rain.
	8 ,,	618.02	15.3	57.7	57.5	Partly clear. Squalls.
	9 ,,	618.20	14.5	56.3	56.3	White mist.
	10 ,,	618.33	14.5	56	65.5	Moon halo. Ror. and Kuk. clear.
	11 ,,	618.33	14	55.6	55.6	Clear towards E.
	12 ,,	618.43	13.8	55.5	55.5	
19 ,,	1 a.m.	618.10	13.5	55.5	54.5	Clear.
	2 ,,	618.10	14	56.5	55	,,
	3 ,,	617.70	13.7	55.7	55	,,
	4 ,,	617.10	13	54.5	54	,,
	5 ,,	617.48	12.5	52.5	53	
	6 ,,	617.15	12.1	53	53	
	7 ,,	617.44	13.1	54.5	54	
	8 ,,	617.46	18.5	63.3	61.5	Fine and clear. Rain 01.5 in.
	9 ,,	618.60	19.7	64.7	63 5	Some light clouds on Roraima.
	12 ,,	618.66	21	67	66	Cloudy.
	3 p.m.	618.12	22	71	67	
	6 ,,	617.40	16.3	60.7	59.5	Cloudy.
20 ,,	6 a.m.	617.10	12.6	53.5	54.4	Ror. and Kuk. in clouds.
	7 ,,	617.28	15	58	59.5	
	8 ,,	617.65	16.7	61	61	Cloudy.
	9 ,,	618.40	18.5	64.9	64.5	
	10 ,,	618.40	19.3	65	64	N. side of Ror. in thick clouds.
	11 ,,	618.60	21	67	66.5	,, ,, ,, ,,
	12 ,,	618.40	20.5	66.5	66.5	,, ,, ,,
	1 p.m.	618.20	20.7	68	69	,, ,, ,, ,,
	2 ,,	618.05	21.3	68	69.5	Sunshine.
	3 ,,	617.90	23.2	70	67.5	,,
	4 ,,	617.40	20	66.7	64	N, side of Roraima unclouded.
	5 ,,	617.20	20.5	67.7	66	
	6 ,,	617.00	16.7	61	60.6	
21 ,,	6 a.m.	617.00	13.8	55.5	59.5	Mist. Rainfall 0.60 in.
	7 ,,	617.24	15.1	58.5	59.5	
	8 ,,	617.49	16.5	60.8	61.5	Mist.
	9 ,,	617.70	19	65.5	65	
	10 ,,	617.70	20.5	67.4	66	
	11 ,,	618.20	20	66.5	65.2	N, side of Roraima clouded.
	12 ,,	618.40	22	71	67	,, ,, ,, ,,
	1 p.m.	618.20	21.2	68.2	65	,, ,, ,, ,,
	2 ,,	617.80	20.5	66.7	64	,, ,, ,, ,,
	3 ,,	617.80	21	69	65.5	Varying sunshine.
	4 ,,	617.25	20	66.5	64	Cloudy.
	5 ,,	617.25	18.5	63.7	62.5	,,
	6 ,,	617.30	16.2	60.5	59.5	,,

1842.	Time.	Water.	Thermometer in Sun,
20 November,	9 a.m.	69	80
	10 ,,	74.5	75.7
	11 ,,	72.7	78
	12 ,,	72	81
	1 p,m,	66	78.5
	2 ,,	68	82.7
	3 ,,	82	79
	4 ,,	71.5	74
	5 ,,	68.5	77.5
	6 ,,	65	67

Mean of Meteorological Observations.

	Total.	÷ No. of observations.	= Average.
Barometer	33,346.72	÷ 54	= 617.53
Attached Thermometer ...	816.4	÷ 47	= 17,30
Dry Bulb ,, ..	2,907.3	÷ 47	= 61,80
Wet Bulb ,, ...	2,874.6	÷ 47	= 61.10

484. The Indians gladly received the orders for striking camp on the morning of 22nd November. They had never felt so miserable in all their lives as they did in this damp raw climate. My comprehensive collection of living orchids had been prudently packed in baskets the day before, after the bout of fever. We were just on the point of leaving when all the clouds unexpectedly dispersed, and Roraima, bathed in the dazzling morning sunshine, towered above us with the burden of his song: "Gaze once more upon my impressive grandeur before we part for ever." Mute and with a full heart, I gazed on high and impressed his grandeur upon my memory for all time. The valley became veiled again with an enchanting winter white. A humble, a sad farewell, and I took my leave of Mt. Roraima.

485. With the morning sunshine increasing in warmth and in between plants, bushes and trees wet with dew, we climbed down the mountain base. At the foot, the other party turned off to the eastward, while I, with some Indians who carried my treasures, made for Our Village, which I reached at sundown, exhausted with a fresh attack of fever. The sounds of a merry gathering greeted me already at a distance because new occupants had during our absence attached themselves to the old: the number of huts had increased by four. Kate's poor husband had come out to meet me quite a hundred paces from the village, the whole of his body covered with roucu, the sign of mourning among the Macusi: he led me by the hand to his beloved wife's grave which had been dug close to the settlement beneath some Curatella trees. The occupants had abandoned the house wherein she had died.

486. Next morning Our Village received further additions to its occupants. An old Macusi chief whose settlement lay at the foot of Zabang had come with his subordinates and offered a large quantity of tobacco for sale. It was only when their own provisions that they themselves carried were consumed that the parties turned back to their own villages, when they would soon be replaced by fresh ones who found just as little here. The population of our colony was thus subject to continual change. On the evening of the 24th November my brother's division returned from the Cotinga Falls which they had only been able to reach after overcoming inexpressible difficulties.

487. The provisions brought by the Serekongs, and the flesh of the tapir were eaten, the cassava field we had bought had been robbed of its crop and so the perceptible want of victuals forced us to start preparations for the return journey as quickly as possible: but before this could be done, we had still to try and procure by some means or other a small supply of bread because, according to what everybody said, we should get nothing on the road for the first few days. Our distress worried even old Kaikurang who, in company with several of his men, left for Canaupang, to enquire whether the fields there could supply any cassava roots even if only half ripe. It was certainly impossible for him to be back under five days, and some yams, boiled for soup, remained our only nourishment until at last that old saw "Hunger is the best sauce" proved itself true, and we found monkey meat delicious: the flesh of the large howler was even exceedingly tasty, but that of the *Callithrix* even after cooking retained the unpleasant smell peculiar to the animal when alive.

488. The Indian thinks nothing of playing some little trick when it comes to a question of gratifying a wish or securing his purpose. They were very keen on several of our articles of trade and yet there was nothing more in the animal world that I did not already possess. All bird-skins that they had offered me for a comb or for a knife had to be refused because I already possessed them in larger quantity than required. Finally, they brought me birds with the most beautiful play of colour which the huntsmen wanted to make out they had shot in a distant mountain valley. The wondrously beautiful creatures also belonged to the genus *Tanagra* or *Pipra*. On this particular occasion they obtained even more than they asked for, because I already believed myself in possession of something novel. There was no doubt about its being a *Tanagra*, when all of a sudden on a more careful comparison of the feathers, it seemed to have a curiously well-known appearance and I now recognised that instead of a new species, I had secured nothing else than a monstrosity put together with a skill so extraordinary that not even a Chinaman would have been ashamed of it. The Tanagra had been doctored with all the kinds of *Pipra* and *Euphone* that were to be found here, and so transformed into this exceedingly lovely species. The same thing had been done with some *Pipra* and *Fringilla* skins. We readily forgave the bargainers this masterly carried-out deception, for they believed that the skins they had tampered with must have the same value for us as the other ones. Judging from the numbers of quartz

crystals they brought along with them these must be present in large quantity at the spot where they are found, an unforested mountain.

489. Kaikurang returned from Canaupang on the day fixed, and brought with him more bread than we had expected, but assured us that this was the last that could be spared from his fields. Our departure was fixed for the 4th, that of my brother for the 5th December: for it was here that we were to part for several months. As already mentioned, my brother with one portion of the expedition was anxious to push on from here to the head of the Cuyuni and then travel down it to Georgetown to receive fresh instructions and secure provisions for the trip to the source of the Corentyn: he would then return to us at Pirara, which we should probably reach before him and where we were to wait until his return. Hendrick, Adams, two coloured men and Sororeng, with some Indians went with him: the other Macusis, Stöckle, the Negro Moore, Fryer, Goodall, together with a good number of Arekunas to carry my fairly considerable botanical collections took the road with me to Pirara.

CHAPTER VIII.

Departure from Our Village—Mt. Waranak—River Yawaira—Carakitta settlement—Mt. Kinotaima—Travelling Ants—Myiothera Tetema and Colma—Phitys leucops—River Warung-kaiti—Valley of the Haiowe—Ewaboes settlement—Return to Torong-Yauwise—Running down the Falls and Rapids—Takutu—River Mona—River Ororopi—Fort Sao Joaquim—Acanthicus histrix—Return to Pirara—Mesembryanthemum guianense—Bitter experiences in connection with my Abundant Collections—Arrival of a Brazilian Boundary Commission at Sao Joaquim—Digging up Indian Skeletons—The rise of the 1843 *Comet over the Horizon of the Southern Hemisphere.*

490. After a stay of 5 weeks which, owing to their being so busily and pleasantly occupied, had passed like so many days, we left good old Our Village completely starved out on the 4th December. Our houses, our flag-staff, everything had to remain, so that should they not be destroyed by the Indians future travellers might know that Europeans had already lived here. As we reached the last piece of rising ground from which we could gaze upon the peaceful valley, we turned round once more, and with our waving neckerchiefs bid a last good-bye to it and to the residents assembled in front of the quarters. After some hours we reached the house situate on the bank of the Wararite, and amongst the occupants who were now present recognised to our surprise the family of pretty Cummiyaure, she herself being busily occupied in grating cassava-root. We had no idea that this beauty resided in our immediate neighbourhood. The father, who had often paid us a visit at Our Village, had always replied to enquiries after his daughter that she had gone far, far away. The many presents received from us on the first occasion, and the special attention paid her by the Paranaghieris may have flattered her vanity, and her father's orders may consequently have been more peremptory that she was never to withdraw from the close vicinity of the house. Father and daughter now formed a most remarkable contrast: one could see in the former's expression how unexpected and unpleasant our arrival was, while the latter betrayed still more conspicuously her delight at receiving a visit from her admirers. Her own eyes, her whole attitude, was the truest mirror of the most naive and innocent coquetry to which only the heart of a harmless daughter of nature can possibly plead guilty. I need not assure the reader that we also had open hands for her here. On our departure, sweet Curly Hair accompanied us as far as the front of the door where she gave each one of us Europeans a fresh cassava cake, she receiving as many kisses as she distributed cakes: she regarded our conduct with roguish surprise, and beckoned long in our direction until the thick forest shut us out from view. Hers was the most beautiful presence that I had come across during the whole of my travels.

491. In the evening we reached the lonely house on the Kukenam, spent the night there, and resumed our journey next day at sunrise so that already by 11 o'clock in the morning we had struck Barapang settlement. In spite of a bad attack of fever, some irresistible force drew me to the Rué-imeru. For hours I felt as if chained to the spot by invisible bands: to say good-bye to the imposing grandeur of this scenery, which yet had such an infinite amount of loveliness and beauty about it, proved so difficult that with each postponed leave-taking I had always to hold back and take still another last look, until finally the setting sun reminded me in earnest that I must get back to Barapang.

492. As our companions were unanimous in their opinion that the descent of the steep rocky wall of the Humirida would be attended with far more difficulties and dangers than its ascent, we gladly fell in with their suggestion to turn more towards the S.W. to the large Arekuna village Carakitta, where we ought to find a quantity of bread and fruit.

493. Before starting in the morning I was again offered a waterhaas, a tame young one: I gave a comb for it, and let one of the boys carry it on the road. On my return from Rué-imeru yesterday they had brought me a dead one, the flesh of which was quite tasty: the largest portion of it, however, I gave to the Indians as a present for cleaning the skeleton.

494. After leaving Barapang and once more descending into the valley of the Kukenam which we followed for a long time, we reached an isolated house amongst the occupants of which our attention was particularly attracted to the perfect figure, faultless proportions and singular decorations of a young man. Immediately above the ankles he had wound human hair twine around his legs into a band about two hands' breadths wide: a similar ornament adorned his arms above the wrist, and the elbows: the Matupa, also of human hair, was broader and thicker, than I have ever seen anywhere on an Indian. According to these outward signs the otherwise gloomy-looking young man, whose features moreover were marked with deep melancholy, must be one of the heroes of the tribe. We asked him to accompany us, but he refused: even among primitive men odd characters are to be found. Besides a "cast" *Boa constrictor* skin well over 20 ft. long that had been found in the forest without an owner, and a few damaged pelts of the *Cebus*, we were offered several fresh cassava cakes which we accepted with sincere thanks.

495. The path next led to a large shady woodland with trees sky-high, and we soon stood once more on the banks of the Kukenam. The corial, that had previously taken us across further up, carried us to the opposite bank, which we followed for a time through the dusky forest, until we emerged at a lovely flat which in the E. and S. was hemmed in by Mt. Waranak. Proud clusters of the magnificent *Mauritia* lent the luxuriant plain an infinite charm: *Cyperaceae* in the most varied gradations of green formed the glorious carpet: *Rhyncanthera*, *Clidemia*, *Miconia*, *Polygala*, and *Hibiscus* strewed it over with white, red and violet flowers: the glittering sunny morning, however, with its pure atmosphere, increased our enthusiasm over the bright and cheerful surroundings. The road was henceforth a continually changing series of

green savannahs and flourishing wooded oases, from the giant trees of which fantastic creepers hung like the rigging of a ship. A loud shriek from a young Indian woman who happened to be at the head of the silent procession, startled us out of our reverie, and brought us quickly to her assistance. Devoid of speech, the terrified creature pointed to the grass whither a rattle-snake, from the bite of which she had been miraculously saved, had made its escape: to follow it in there would not be ventured by us, much less by the Indians: a far more certain way of destroying it being to set the grass on fire.

496. After crossing the smiling flat and passing an unoccupied settlement, we climbed the western spur of Mt. Waranak, from the top of which we had a delightful view of Carakittta, our day's objective, that stood on a rise in the valley of the Yawaira before us. Even the very top was again occupied by that charming vegetation of shrub-like *Ternströmia*, *Befaria*, *Bonnetia*, *Thibaudia*, and innumerable *Sobralia*: amongst several *Anonaceae* associated with them I need but note the aromatic smelling *Xylopia salicifolia* H.B.K., and *X. frutescens* Aubl. which had completely disappeared in the valley. In between this exquisite scrub, it was a case rather of sliding than of travelling Indian file down the steep declivity. Arrived in the valley we crossed the Quaima, which has its mouth in the Yawaira some miles further to the westward. After an almost two hours' march through the picturesque valley we reached the Yawaira itself which flows to the North, is a tributary of the Caroni,* and later on makes its way into the Orinoco. The Yawaira that we likewise crossed may be regarded as the most south-easterly affluent of the Orinoco.

497. Mr. Fryer was tormented by hunger as much as I was, but experience had taught us that this could be seldom satisfactorily satisfied if we arrived at a village simultaneously with all the others, because there were then too many hands anxious to seize the victuals offered. Our idea of reaching the settlement by hook or by crook in advance of the rest was as rapidly planned as it was surreptitiously executed. The settlement was in front, so we could not lose our way: we forged briskly ahead. Except for Moore, the Negro, who may have had a presentiment of our intentions and had followed us, we soon got out of sight of the remainder of the party, and were already rejoicing over the heaped-up pepper-pots and other delicacies when we suddenly struck a boggy bit of ground strongly impregnated with ochre. The welcoming village lay on the other side of the swamp and beckoned down seductively from the rise: the pathway, even if it was the wrong one that we had followed in our ardour, had led to this quagmire, and according to every probability must run its course through it. Trusting to this, we pursued our way until we finally sunk into the ochreous mud up to the hips. After prolonged anxiety and exhausted strength, Mr. Fryer, with the loss of his shoes, managed to extricate himself out of the sticky sedgy sludge and reach solid ground first: I soon followed, but Moore was still worrying and groaning away behind. Covered with sweat and dirt, we looked at ourselves for a long time in silence, and then burst into loud laughter over

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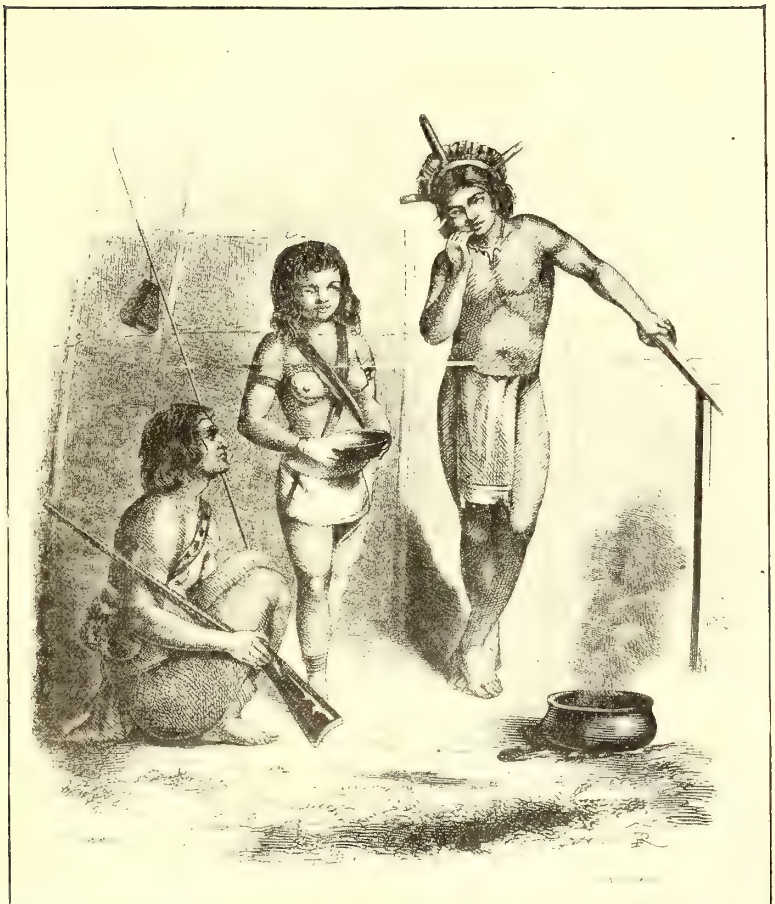
*—*i.e.*, *via* the Wairing and Kukenam.—(Ed.)



Zwei Wapisiana Indianer und ein Mädchen von 11 Jahren, jenen eine Trinkschale mit Paiwari reichend

GROUP OF TWO WAPISIANAS AND A GIRL 11 YEARS OF AGE.

our frustrated designs and misplaced zeal. Ashamed and abashed, we climbed the rising ground on which stood the village where, contrary to expectation, the others had not yet arrived. Instead of meeting Goodall's bitter chaff we were received by the smiling residents, who had been watching us in our troubles, with well-filled cups and still more welcome pepper-pots. The contents of the latter looked so inviting that we sat down to business around the biggest one, without bothering over a change of clothes, and bravely helped ourselves with our fingers, according to Indian fashion, but never enquired beforehand as to what we were eating. Our hunger appeased, we became curious to know what we had satisfied it with. We learnt that it was a real olla podrida to be sure, made up of several monkeys, an ant-bear and a kaiman tail, but we found it excellent, and it proved equally as tasty to the caravan that followed.

498. The Carakitta residents, having visited us at Our Village were almost all known to us. The settlement consisted of five fine large beehive houses, one of which was put at our disposal. This kind of architecture appears to be peculiar to the Macusis and Arekunas, they not being met with moreover in any other tribe. From the village we had a lovely view over the smiling savannahs, which were still enclosed on all sides by picturesque wavy mountains, above which the high Pa-Epping towered in S. by E. Eminently thriving provision fields planted up with cassava, yams, potatoes, and sugar-cane lay along the banks of the small stream Corabo, a tributary of the Yawaira in close connection with which was a thick fence of arrow reed, *Gynerium saccheroides* Humb. Bonp. The glorious foliage of the trees covering the southern hills, their rank grassy flats and the numerous creeks and streams, as clear as crystal, which meandered through the refreshing wealth of pasture—everything reminded me vividly of the valleys of the Harz, while a giant *Siphonia elastica* Pers. with its widely outspread limbs bade me remember that I was many thousand miles away from my native mountains.

499. I could hardly believe my eyes when, a little later on, I was visited by a friendly shame-faced boy, with a bundle of tobacco leaf in his hand, whom, after long reflection I recognised at last as handsome Tamanua: I soundly rated the puzzled parents who, in order to make more sure of our not taking him away, had cut off the lad's chief beauty, his lovely hair.

500. With the ready consent of the chief, all our hopes and wants for a supply of food from the rich provision fields were fulfilled. By next morning a commencement was made with the scraping and grating of the roots, and the baking of the bread, the old chief having at the same time informed us that he and some of his subordinates would be accompanying us to Pirara and Nappi to barter some urari poison: a double supply of rations was therefore required. A young man of from 18 to 20 years of age, here also attracted our attention on account of his faultless proportions and handsome features, but who in his whole behaviour, in his movements and attitudes, was so affected and dandified as to keep us in a continual state of laughter. Though a civilised idiot may have more than enough ridiculous foibles, such weaknesses are com-

pletely changed to burlesque in savage man. Had the vain coxcomb finally completed his careful body-painting, which must have been washed off and renewed ten times before meeting with his approval; had he, after many a fruitless attempt, girded his loins in the approved folds of drapery with the long piece of blue cloth (salempore) that he had probably obtained in barter; had he thrown the ends over his shoulders like once upon a time the proud Roman wore his toga; and had he then leant upon the shoulders of his second Ego, another young Indian; the one with a flute under his arm, the other with it in his mouth—he would verily have been able to pose as model for Apollo before the most critical artist. In spite of this, his affected and unnatural conduct proved an inexhaustible source of amusement for us. The two friends actually seemed to have grown up together, the one being always the shadow of the other. Both were aware of the superiority they displayed among their fellow villagers, because a thin moustache adorned the upper lip of the latter individual. Vanity among the Carakitta residents seems to be held in just as bad credit as with us, for Castor and Pollux, as we called these two dandies, were treated with open contempt by everybody.

501. The complaisant friendliness of our hosts had quickly established the most intimate relations: the few days' stay amongst them were enlivened with joke and jest and when they had showed us all their dances, and had given exhibitions of their games, they asked us to let them see the dances of the Paranaghieris. Waltzes and galops must have seemed peculiar because these made their sides split with laughter, and on enquiring the reason, it was simply this: that they were mad (*unsinnige*) and fatiguing dances. The quadrille on the other hand met with the most general approbation and the more methodically the steps were executed the greater was the applause.

502. On the morning of 8th December, with a salvo from every gun available, we left friendly Carakitta, accompanied by the old chief and his pretty daughter—sickness preventing his wife from coming—together with a number of other villagers: we crossed the Carabo on the thickly hemmed-in banks of which I found a new tree-like *Inga* in bloom, and then climbed Mt. Kinotaima, the slope of which was covered with exquisite *Thibaudiae*, *Ternströmiae*, etc. We followed the crest for several hours over a tableland, only here and there interrupted by insignificant hills, which consisted of the most flourishing forest oases wherein were yet gathered, besides the genera above mentioned, different species of *Anona* and hitherto unknown *Melastomaceae*. We then neared the south-eastern slope of Kinotaima, when the sandstone-range of the Humirida with its wall-like declivities emerged ahead of us in N.E. and the lovely valley of the Muyang lay at our feet. The summit of Kinotaima rises about 2,000 feet above the latter, and 3,000 feet above sea-level. Still again I turned my gaze, and yet once more my looks lingered on the beautiful foliage of those families of plants, to take farewell of proud Erimitipu, of Mareppa-Emba in the West, of Ucaraima in the South-West, and now to greet with heavy heart the bleak granitic mass of Mairari lying in front of me in the distant South-East. We

also soon distinguished on Humirida the spot on its steep mountain wall that we had climbed: we had already travelled round it, for it now lay several miles on our North-East.

503. Amidst huge blocks of sandstone we made the descent into the valley of the Muyang, and soon, on looking back, there was nothing to be seen but rocky boulders tilted and jumbled one on top of the other, when we finally struck the thick rank forest that reached up to the Kinotaima slope. The forest had assumed another character: the *Thibaudia*, *Ternströmia*, *Andromeda*, *Clethra*, *Sobralia* and their allies had disappeared, and better known forms of gigantic size again spread their shady limbs over our path. After crossing several tributaries of the Muyang, and dead tired, we reached Yawangra, the lonely settlement at the foot of the Humirida, towards evening: it was here that we had left Sororeng's wife, but she, although not yet confined, had already returned to Pirara with the three absconders whose sense of honour had been hurt at Roraima.

504. On striking camp in the morning and wanting to repack the skeleton of the *Hydrochaerus* that I had tied to a tree the night before, I found that it had disappeared: the hungry dogs had swallowed it during the night.

505. In Yawangra Village, that we reached on the morning of the 10th December, we found on this occasion not only Indians suffering with eye disease, but also a shortage of cassava and were straightway advised to turn more to the South, because in that direction we should find a thickly populated settlement: we followed this advice all the more willingly because the many days' starvation was still fairly fresh in our memory. The rank forest that we came across again showed us giant trees of *Bombax* and *Carolinea*, which yielded nothing in size to those on the Takutu. The luxuriant *Phenacospermae*, that reached a height of from 40 to 50 feet here, upon the bursting of their capsules with a loud report, spluttered their ripe seeds like hail upon the thick leaves, and then down on to our heads. *Passiflorae* with brilliant red flowers, *Coffeaceae*, like *Psychotria*, with orange-coloured ones, and *Cephaëlis* with blue blossoms, entwined themselves up the slim colossal columns and forced their way through the tops of the giants striving to reach the heavens, or hung in light festoons down from the widely outstretched branches. The soil consisted of a greasy loam mixed with sand, like what I found almost everywhere in the savannah oases.

506. Our procession continuing with even step in Indian file must have come across some obstacle ahead—it stopped. Full of fright I hurried up: the ones in the lead stood in front of a brown 12 to 16 foot broad moving band, for the thickly-thronged host of wandering ants that was just then blocking our way looked just like that and nothing else. To wait until it had passed would take too long: it had to be crossed with a smart run and some long jumps. Covered up to the knees with the now angered insects, we got over the dense mass, and yet, in spite of our squeezing them with our hands and trampling them with our feet, we could not escape the painful bites of the irritated creatures. If we Europeans came out of the ordeal with our skins whole, the poor

fellows without breeches, the Indians, felt the effect of the risky undertaking in its full force because the furious insects were able to revenge themselves on their naked legs with impunity. I have seldom seen anything more ridiculous than the gesticulations and antics of the tormented Indians when stripping the biting and nipping beasties off their naked bodies.

507. If such a host, coming from no one knows where and going no one knows whither, does seize everything that comes in its way, it nevertheless has its own enemies, particularly among the birds of the genus *Myiothera*, of which several species accompany it in large numbers. *Myiothera Tetema* Vieill. and *M. Colma* Lath. are never wanting: but its greatest enemy is *Pithys leucops* Vieill. The latter appears and disappears with these legions, at least, I have never met it elsewhere: the Indians assured me of the same thing, the nest and eggs being entirely unknown to them. While the first mentioned birds follow the procession flying on the ground upon which they also devour their booty, the latter flies from shrub to shrub up and down the sides of the marching host, makes a swoop into the lines, seizes the ant, and devours it on the bush. However shy the bird may otherwise be, it can be easily shot when feeding, but it becomes more difficult to pick it out of the moving host when shot without getting bitten by hundreds of revengeful insects. The small delicate white feather-plume on its head which can be erected at will and the similar-coloured tuft on the throat, give the bird quite an interesting appearance.

508. After we had crossed yet a few more tributaries of the Muyang and had passed over a fairly high wooded hill, we reached the forest edge, hemmed in by bleak mountains which we crossed in an easterly direction between quartz and granite boulders. The sandstone had also disappeared. The contrast between the landscape that lay behind us and the one in front was something truly heartrending. The summits and slopes, yes, even the valleys that we strode through, were only covered with low herbage and the rank bushes and streaks of forest were conspicuous by their absence, and only now and again some ité palms raised their proud heads on the sides of the streams, or on the swampy spots. Everything around was dismal and desert. We pitched our night's camp on the banks of the Warungkaiti, the milky water of which was shaded by groups of Mauritia, so as to continue our journey eastwards at sunrise.

509. Next morning we crossed bleak hills with quartz and granite rocks down into the valley of the Haiowe which flowed from the North-West into the Davora, a tributary of the Zuruma. The valley again became more picturesque not only on account of the isolated copse everywhere covering the heights, but also owing to the alternation of the rough collections of rock, wall-like cliffs and clefts. On the slopes as in the valley, a milk white quartz made its appearance in all directions, partly in the form of giant needles, partly as fragments of all sizes, that covered the sides and base. After crossing the river and traversing the valley in a south-easterly direction, the way again led uphill. A beaten Indian path on the top indicated the vicinity of the longed-for village.

Surrounded by bleak mountains crowned with rocky bluffs and pinnacles, amongst which Mt. Amboina already known to us in the North-East, and Mt. Mairari in the South-West particularly engaged our attention, we followed the dreary summit and watched the play of the numerous lizards that were sunning themselves on the warmed granite and quartz boulders without our managing to catch even one. Finally, after pursuing the path for some hours, a few miserable bushes made their appearance again on the banks of a small mountain stream: all of a sudden two Indians broke out from amongst them and with the fleetness of deer rushed to the mountain slope.

510. By 12 o'clock we had reached Ewaboes, a village lying in the valley, the biggest settlement that I came across on the expedition. The different styles of architecture of the houses already indicated at a distance that the occupants could not belong to one and the same tribe, a fact that was soon confirmed. They were Macusis and Wapisianas. Each tribe had its own chieftain. The Wapisianas who previously occupied the Takutu had been so frequently harassed by the slave-raids of the Brazilians, that they had withdrawn to the safe mountain-ranges, and joined the Ewaboes residents. Just as this village was the largest and most populated that I had come across on my journey to Roraima, so was it also the first example of such social life between two tribes. Among the almost 200 occupants we met a number of acquaintances, visitors from Torong-Yauwise.

511. The copious supply of cassava bread and smoked fish placed before us was heartily appreciated, but still more welcome to us Europeans was the fine breed of fowls which supplied us with one of the most substantial dinners that we had already for a long time past wished to enjoy just once. While eating, I watched with the greatest intent a young deer that had been caught in the savannah only a few days before, and had been handed over to a young Indian woman to bring up. The elegant creature had already become quite accustomed to its foster-mother: the latter had only to kneel down, and to call, for the four-footed suckling to spring along immediately, to take her breast, and to suck it with the same jolting movements that are peculiar to all ruminants. The animal had as much confidence in the brown figures as it had fear of us Europeans.

512. The offer of both the chieftains not only to supply us with cassava bread and smoked fish, but also to transport it to Torong-Yauwise was accepted with redoubled thanks, because we were anxious to stay a few days and yet could expect no provisions there. According to what both these men told us, the Cotinga was not fordable on account of the high water: to reach the neighbourhood of our boat we would have to make a considerable circuit, but this would be curtailed for the carriers by sending two Indians off to-day with orders to meet us with our boat at the spot known to them where we should strike the Cotinga. (Sect. 515.)

513. Sunrise found us already on the other side of the Davora along one of the most troublesome and tiresome roads that we had as yet

experienced. Up hill and down dale, it went over nothing else than quartz rocks and granite boulders where we had to be continually skipping from one to the other—an exercise which under the scorching sun very soon tired us to death. Finally, after progressing in a southerly or south-easterly direction and jumping for hours, across and over gulleys, scrubs, mountain heights and slopes where mountain streams often splashed down between our stepping stones, we reached the ridge top of a mountain range at the foot of which, to our intense delight, we saw a savannah spreading itself out in the south, south-east, and south-west horizon. It was upon this savannah that here and there a group of trees, an oasis, rose like a ship upon a greenish sea: the verdant streaks of forest indicated the meandering course of the Cotinga and its tributaries as well as the Zuruma. In the west one believed one could see ancient strongholds and castles in the cleft granite crest of Mt. Mairari. All the troubles of the last dreary days were forgotten. Arrived in the savannah we turned to the eastward and followed the foot of the mountain chain. With the shout of "Piatzang" the Indians drew attention to our old friend which rose in the orient still further back in the bluish distance behind the wooded borders of the Cotinga.

514. By sunset, and dead tired, we finally reached the Cotinga, about 2 miles below Piatzang and 6 miles from the spot where we had left our boat: here we proposed waiting for it. Later in the evening we had to be witness once more of one of those cruel scenes in which all the higher instincts peculiar to the Indians were contradicted. A kaiman had foolishly come into the close proximity of two Indians while fishing, and two lucky balls seemed to have killed it. But as the creature was being dragged on shore, it pulled itself together, and defended itself with all the energy left at its command. There was then re-enacted the same gruesome scene that we had already, in spite of our remonstrances, witnessed on the Zuruma: large pointed posts, the tips of which the Indians had burnt in the fire and set alight were jammed into the open jaws until it breathed its last under the most awful torments and wild yells of pain. In reply to all our protestations and persuasions to stop this fiendish cruelty, they simply laughed and said—"Were we to fall into its jaws it would tear us to pieces just in the same way."

515. The unpleasant impression left upon us by this gruesome sight was at least somewhat obliterated by the nearing paddle-strokes of our boat, out of which a number of known voices were shouting their cheerful "Matti, matti!" The two Indians from Ewaboes had not avoided the roundabout circuit (Sect. 512) without hastening to Torong-Yauwise and informing the inhabitants of our return, whereupon several immediately joined them to greet us at the spot for crossing. The question as to our things left behind were answered to our complete satisfaction. Our old chief from Carakitta had sprained his foot that morning by jumping from boulder to boulder, but little notice was taken until evening when it was evident that he could not continue his journey to Nappi. The accident was regarded by all the Macusis and Arekunas as

a bad omen and led all the company, except those who were bound to us by agreement, to return to their settlement: they did not want to accompany us even as far as Torong-Yauwise.

516. After saying good-bye in the morning to our honest but superstitious chief and landing on the eastern bank of the Cotinga, we trusted our baggage to the corial and its pullers as far as the old landing place and made for Piatzang, the granite massif of which we could now admire at close quarters: we next crossed the Mt. Waikuah at the site of our old camp, and again reached Torong-Yauwise where the residents heartily welcomed us.

517. The absolute trust which we had placed in the honesty of our friends had not been abused: we found our things untouched although the house in which our baggage was left had been occupied during our absence by the family to whom it belonged. Every child in the settlement knew that the little boxes and cases contained articles of trade, to possess which their folk had accompanied us as carriers, undertaken every exertion, and willingly bartered their weapons and ornaments, that it had taken them months to manufacture. By an oversight our small barrel of salt, the greatest luxury known to an Indian, which he only eats by the grain, had been left exposed, and yet this was regarded so sacredly as to allow a layer of dust settling on it. Our three absconders, together with Sororeng's wife, had also spent several days here, and because the latter could not travel further on foot, they had taken the boat which we had borrowed at Warami, to travel in it down the Cotinga.

518. So as to resume our journey to Pirara as quickly as possible, we made all arrangements the very next morning for the transport of our baggage to the landing stage on the Cotinga, wherein the Torong-Yauwise residents lent every necessary assistance: our late companions received their well-earned reward, and started home to their mountain valleys.

519. On the fourth day after our arrival at Torong-Yauwise, the number of strangers who had come to visit us was again over 400, some of whom had been attracted by curiosity, others with a view to trade. Among the numerous throng of known and unknown Indians were to be seen a pair of dwarf twins, brother and sister. Both were of the same height, 3 ft. 6in., both equally unwieldy, a repulsiveness that was yet increased by the long endlessly matted hair, both of them welcome objects for Mr. Goodall's sketch-book. But curiously enough, the charming pair showed the greatest aversion and fright to sitting, and it required many a present before the ill-shaped man could be got to consent. Our hopes that the sister would prove equally complaisant, were in vain, because when Goodall wanted to immortalise her with his pencil, the little daisy had disappeared without leaving a trace. From fear of the imaginary danger threatening her, she had set out alone, during the night, to return to her far-distant home. The noisy scenes, the games and the dances which always still continued to interest us, were naturally repeated every evening.

520. Having noticed with what enthusiasm during my first stay amongst them, I had collected their mammals, birds, weapons, and decorations for which I had gladly given them knives and similar things in exchange, the people at the settlement had, during my absence, shot everything that they had come across, but unfortunately skinned them in a manner and style that rendered the treasures useless. I regretted this most of all with the pelts of some savannah dogs and the silky little skin of the *Myrmecophaga didactyla.* I was all the more keen on buying living animals brought to market because I found that the whole of my menagerie that had been left behind was dead. The large rock-crystals that they offered to exchange were darkly impregnated with manganese oxide: according to the statements of the Indians, the Portuguese had already carried off all the clear ones.

521. We had little or no provisions to expect at Pirara, and therefore utilised the present favourable opportunity offered by the presence of the numerous assemblage in buying up everything that was eatable and palatable, particularly a large quantity of maize.

522. We had successfully managed the Cotinga on the upstream: what the doubly dangerous trip down it was going to be like, we had yet to wait and see. At every fall the expensive astronomical instruments had to be protected from accident, for which reason they had to be carried to the mouth of the Mawitzi where the most dangerous rapids of the Cotinga ended. The number of Indians required for the purpose was soon obtained, and by the 16th December, Mr. Goodall left with them for that direction. The gaps that resulted in the numbers of our paddlers by dividing the company, were quickly filled by villagers of Torong-Yauwise, and accompanied by visitors to, and residents of the settlement, we hastened off on the morning of the 17th to the bank of the Cotinga. The river torrent, tearing along, brought us by midday close to the first rapids, the roaring and raging of which we had already recognised at a fairly long distance off. I had already ascended many a rapid, but I had never shot down one. At the foot of almost every fall, every rapid, are to be found a number of crags, from which the rushing mass of water rebounds to form raging whirlpools. As soon as the sloping bed of the river becomes visible, the bowman takes charge: his business is to watch the ruffled surface of the water and see whether there are any of these hidden crags lying in the line of the dangerous chute, and to signal their presence to the captain (steersman) at the right moment. Deathly silence reigns in the boat: only their looks speak: the men grip tight hold of their paddles, and by pulling their hardest as they near the head of the summit, add still further to the speed that has been already increased by the impetus of the current: the object of this manoeuvre is for the craft to cut through the whirlpool and not fall into its power and be dragged into the deep. Should the bowman miss seeing one of these hidden rocks and the corial, shooting down, run up against it, its destruction is very generally the infallible result. Quietly, and without daring even to touch the sides of the boat, the remaining passengers have to sit perfectly still, so as

not to disturb the equilibrium at all by any imprudent jolt. With frantic swiftness we sped on to the sloping surfface: the savage roar came closer: one's blood warmed by the mental strain, and heart about to burst, a movement quick as thought, then an up and down oscillation of the frail vessel, a joyous shout from the paddlers—and we were safely past the dangerous rapids. The falls of the Essequibo would have to be engineered in this same manner: the very thoughts of it already made our pulses beat. We were less fortunate in running the second series of cataracts. One of the mischievous rocks escaped the bowman's notice: the boat grazed it, and a strong jolt that threw him into the raging current, from which he only rescued himself by his complete mastery of swimming, made us for the moment fear for the safety of both crew and boat: fortunately the corial had struck the rock but lightly, and the captain's presence of mind saved it. The same fate awaited my boat on the following morning when I lost the whole of my menagerie, except a parrot, because, before we could fish the cages, that had been immersed by the violence of the shock, from out of the stream, the occupants had got drowned. It was and still remained incomprehensible to us that the vessel was not smashed into thousands of splinters or overturned, because she staggered here and there for quite a minute.

523. By evening of the 18th we had reached our torture-chamber at the junction of the Cotinga and Zuruma, where we found the kaiman's skeleton most excellently prepared, though there was unfortunately wanting a piece from the backbone that probably a jaguar had swallowed.

524. We travelled down the river next morning with the speed of an arrow, greeted the formidable granitic massif of Maikang-Yepatori and Arawanna just as we were saluted by the waving flag on the former that was fluttering gaily in the evening breeze, passed without further mishap the remaining series of cataracts, and at the mouth of the Mawitzi halloa'ed to Mr. Goodall, who had already got there the evening before. A fox, the Waręré of the Macusi, that an Indian of Goodall's party had wounded and caught, caused us much amusement. They had tied it to a cord, and if anyone approached, it went into a downright rage. Several bees' nests that were found on the *Curatella* trees of the savannah supplied something very choice for the evening.

525. On the morning of 20th December, we paid off the Indians who had accompanied Mr. Goodall here, and after finding room in the corial for the astronomical instruments, resumed our journey, when, owing to the captain's carelessness, we almost met with sudden death at the Aratiari Rapids, the last that we had to shoot.

526. About 2 o'clock we reached Warami Village, but saw nothing more of our young tapir which, according to the statements of the Indians, must have died: this seemed far less probable than that they had been unable to withstand the craving for such tasty flesh. Our absconders had also spent the night here, and had likewise taken the corial with the promise to send it back as quickly as possible, a promise of which the owner did not entertain the slightest doubt.

527. In the evening, the Takutu once more rolled in front of us. We again pitched camp on the sandbank which, on account of the low state of the water, was considerably enlarged. The journey, that had occupied 12 days in going up stream, was completed in little more than three in coming down. While Mr. Goodall next morning set out with the remaining boats for Pirara, I went with Fryer down the Takutu to pay Captain Leal at Fort Sao Joaquim our promised visit, and at the same time to fetch the farinha that had already been paid for

528. On account of the waters of the Takutu having fallen several feet, many sandbanks became visible. The river banks showed the same scanty vegetation as above the mouth of the Zuruma and Cotinga, so that the savannah often reached right down to the water-side. To the West, Mts. Maruki and Durura constituted the only break in the broad monotonous plain. At first the Takutu followed an uninterrupted course towards the South-West till, in a few hours' time, it suddenly turned to the South-East. A few miles from this remarkable bend, the Mona joined it from the Eastward. Six miles above the first bend, the current suddenly strikes its old course again to the South-West and three miles further on the blue waters of the fairly large Ororopi, also from the East, become united with it. The north-easterly point of a large island lies quite close to the mouth: a second island lies some miles further down.

529. With these islands we were in the immediate proximity of the Fort, which was only hidden from us by a small bend. Unless therefore, we wished to appear in slovenly clothes before our friends and the still greater Honourables with whom we were acquainted, it was now time to make our toilette. Two shots gave notice of our approach. As we came round the bend there stood the little Fort Sao Joaquim in front of us upon the high easterly bank of the Takutu, close by its junction with the Rio Branco, Parima, or Urariquera. A military post from the rampart called upon us with imperious voice to "Halt," which we, as in duty bound, obeyed, until after a short while another voice gave us permission to land. As we climbed the bank we saw an officer coming out of the exit towards us. Our hopes of greeting friend Leal in the advancing figure were disappointed: a strange person reported himself as Major Coelho of the Artillery, at present the commandant of Fort Sao Joaquim, but he gave us a hearty welcome. In reply to our anxious enquiries, we learnt that Captain Leal had been impeached in Para for having carried on relations of too friendly a nature with the nation's enemy, that he had been relieved of his post as commandant and that he was now only attached to the Department of State Farms, and was at present engaged on one of them. Father José was also not present. This first piece of bad news made us feel really sorry for poor Leal, but the second bit of information was still harder to bear: that probably, in the upset of the disgrace into which he had fallen he had forgotten to leave behind the farinha which we had paid for.

530. The small Fort, situate in 3° 1′ 46″ lat. N., was erected at the time of the invasion of a detachment of Spaniards from New Guiana who in 1775 made their way up the Caroni and Uraricapara as far as

the Rio Branco and intrenched themselves in the neighbourhood of the Yurumé. Its walls are built of a red fine-grained sandstone, probably of the "Old red" which is found in the neighbourhood. The fourteen embrasures were supplied with eight nine-pounders. The gun-carriages were nearly rotten in general, the majority of the guns on the bare ground, and peaceful pasture sprouting at their sides. The eastern face of the fort formed a bomb-proof casemate which the commandant occupied: under it were the sleeping-quarters of the soldiers. Sixty men of the Provincial Militia in white cotton pantaloons and jackets with black facings, a few sergeants of the active services and Major Coelho formed the garrison. The old condemned English muskets, dating from the reign of one of the Georges, might well have been handled by the powerful English, Scotch, and Irishmen, but not by those weakly striplings of Mars, who streaming with perspiration, were worrying themselves to do the honours with these blunderbusses.

531. From the number of vessels* in the neighbourhood of the Fort, out of which regular mountains of building material had been discharged, it really seemed as if it had been determined to put the fortress in a better state of defence to command respect, than that in which it at present stood, because even the English were no longer to be trusted by the political party which had hitherto been considered the most stable. In spite of the experiences which Major Coelho had learnt from the fate of Captain Leal, the little man was nevertheless full of friendship and courtesy. He informed us that he was daily expecting still more engineer officers to direct operations, and showed us the model of a new gun-carriage invented by himself, but which appeared, both to Mr. Fryer and myself, just as unsuitable as the half-rotten ones that were still being used.

532. The discharge of the materials and their transport to the Fort was managed by Indians whose language neither the Macusis nor Arekunas understood. They belonged to various tribes on the Rio Negro. There was something deeply affecting, infinitely disquieting, in the mute gestures with which these poor unfortunates contemplated and welcomed our free companions, who in return cast a glance of pity upon these victims of some slave raid, and then one of rage and anger upon their drivers.

533. In a straight line with the Fort, along the banks, stood the real dwelling of the commandant, and of the Friar, the church, and the small huts of the vaqueiros. An innumerable host of carrion crows had settled on a giant *Bombax globosum* and seemed to be awaiting their accustomed meal.

534. The farms of Sao José, Sao Bento, and Sao Marco, formerly the estates of the Antonio Amorini and Evora already mentioned (Vol. I. Sect. 864), now the property of the Government, lie in the environs of the mouth of the Takutu. Captain Leal received a quarter of the profits. The number of cattle that were every evening driven into

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*—The Igarité of the Brazilians is a large peculiar boat, only built for the navigation of the Rio Branco and Rio Negro. It has a short mast with a sail, and no keel: bow and stern are stumped.

the pens was 4,000, that of the wild ones, but distinguished by the Government brand, 6,000: besides these, 600 horses must also have been here. The herds are in charge of 40 vaqueiros who receive the same pay and rations as the soldiers. At eight o'clock in the evening the whole garrison, as well as the vaqueiros, assembled in the sleeping quarters to say their prayers and sing their even-song in the Latin tongue. We slept with the Major in a room in which the whole furniture consisted of a table, roughly nailed together, a seat similarly constructed, and a bed.

535. At 6 o'clock in the morning the unusual sound of the Reveille woke me out of my deep sleep. The daily rations were just being issued to the garrison: these consisted of 1lb. beef and a quantity of farinha, for which one bullock was killed daily. The poor soldiers had not received pay for three years: they bothered us almost to death to buy the tobacco, which they seemed to possess in large quantities, in the form of 5 to 6 ft. long rolls of varying thickness, and at the same time of stony hardness, prepared in a peculiar fashion. After the leaves have been plucked, they are hung up in the shade for some time, and then rolled into 2 to 3 in. thick cylinders, which are tightly wound round with bast; a few days later the bandage is removed, and wound on again anew but still tighter: this is now repeated until the whole becomes laced up into a tight compact mass when it is corded round with the bast of a *Maranta*. The tobacco exported to Europe is almost entirely manufactured into snuff, but here it is smoked, in spite of its strength, in cigarettes both by the men as well as by the ladies. It is one of the surest expressions of respect or one of yet tenderer feelings for a senhora to prepare such a cigarette, to light it, to take a few whiffs and then hand it to a senhor.

536. As we returned from a morning visit to the Lord High Honourables with whom we had become acquainted at the mouth of the Zuruma, the commandant's cook had just cut up for breakfast the last *Acanthicus hystrix*. From its external appearance, the fish belongs to the most interesting of the *Siluroids*, and I regretted all the more that I had not come a minute earlier, and secured a specimen for my collection. The Rio Branco seems to harbour it in fair quantities, and up to the length of 4 feet. The most favourite spots it selects are excavations in the banks or under the roots of the trees. The Indians of the Rio Branco call it Uacari. No animal could have a better right to its species name than this *Acanthicus*, because its whole body, including the fins, is more or less thickly studded with spines and humps. However repulsive and unappetising its appearance may be, its flesh nevertheless possesses a very pleasant taste.

537. All attempts designed to catch a specimen to-day remained fruitless, and I had now to trust to Major Coelho's promise to send me a few of the fish to Pirara, a promise which unfortunately remained just as unfulfilled as that of Captain Leal's concerning the delivery of the farinha we had purchased. Major Coelho took pity on us and sold us two arroba of farinha which at least protected us for the first time from our hollow-eyed visitor, Hunger.

538. When we took leave of the friendly Commandant and the Fort towards midday, the large Brazilian flag was unfurled in our honour. We made but slow progress on our return journey because in consequence of the strong current of the Takutu, we could hardly advance more than one mile an hour.

539. On the morning of 24th December we reached the fazenda of Friar José. While taking our stinted breakfast there, our attention was drawn to a boat, not only on account of its coming down the Takutu with a completely blue sail, but particularly owing to its crew wearing large white straw hats. The greater the difficulty in solving the puzzle, the more unexpected did its solution become when, upon the vessel drawing close, we recognised our former craft from Warami, and in her crew men whom we knew from Nappi. Our deserters had fortunately reached there, and as some of the villagers wanted to make a business trip to the Parima and obtain some dogs, spun cotton, etc., they had willingly undertaken to bring the boat back to Warami. A large piece of salempore served them as a sail. The news they brought us proved a sad Christmas present. They were the first to inform us of the death of our faithful and conscientious friend, Youd, and at the same time that Pirara, formerly so lively, was occupied by no one except Tiedge and an old woman. Mr. Goodall and his party had met them at the junction of the Mahu with the Takutu, where they were busy cutting up a tapir. Overcome with the painful news of the death of one whom we had learnt to know in life as one of the bravest and noblest of men, we continued our journey. Both river-banks consisted of large quantities of the beautiful *Martia excelsa* in full bloom. The Macusis call this lovely tree Ajawi-ye. The monotony of the morning and evening of Christmas Day was at least varied somewhat by our efforts, though vainless, to kill a tapir which we often met in twos and threes on the sandbanks at these times. A number of tortoises stretched their heads out of the water close to the sandbanks upon which they searched for a place to lay their eggs.

540. On the second of the holidays we reached the mouth of the Mahu. Fledged young, usually two, rarely three, were everywhere to be found in the nests of the Jabiru. In spite of every effort we did not succeed in supplying a roasted duck for the festive board: the young Jabiru remained our only resource. But to climb one of the colossal trees was an impossibility: one that was crowned with such a nest would have to be cut down. In the course of an hour the tiresome work was completed, the giant fell over and in its fall killed one of the three youngsters which was immediately gutted and cooked. The lives of both the undamaged ones were spared, as we wanted to take them with us to Pirara: they proved at first so stubborn and cross that we could not go near them, but calmed their tempers fairly quickly and very soon became tame. Of course they proved a pair of almost insatiable guests, but fortunately they swallowed everything we threw to them, even the flesh of their own brother. The noise they produce with their beak has much similarity with the "clatter" of our storks.

541. On the 28th the mouth of the Pirara with the boat sent ahead of us was again in sight: on account of the low level of the water she had not been able to get farther up than to our old landing place. Mr. Goodall had already left for Pirara two days before, while Stöckle was anxiously awaiting the arrival of the carriers, and to greet his countryman Tiedge at last. After placing our boat under his charge, I left with Mr. Fryer for the village. But what changes had again taken place in the broad open savannah during our absence! The huge sheet of water, the hills covered with a green carpet, everything had disappeared. Wherever one's eye turned, it was met by nothing else than a vegetation yellowed and parched in the hot sun: it was only in the depressions that it still noticed here and there some small green swampy areas. On the way, Tiedge met us with some Indians: he was hastening, overjoyed, to his countryman, to keep him company and unburden his heart: the brave fellow was as happy as a child as he once again shook hands with us, the likelihood of which he had already doubted. The hasty accounts of the solitary life he had been living was something so awful that we begged him to postpone their recital until his return to the village and in the meantime relieve Stöckle, to whom his visit would prove endless joy, as quickly as possible from his lonesomeness.

542. It was yet before sunset that we reached Pirara, which we hardly recognised in its waste and wilderness. A portion of the church built by the Brazilians had already fallen in. A similar fate had befallen a number of the houses. Though our house still stood, the vermin had gained so much the upper hand that we gave up all idea of moving into it to-day, and billeted ourselves on Mr. Goodall, who had gone into Mr. Youd's house and had already undertaken its thorough cleaning and repair. Although on our first arrival at Pirara, as well as on the ascent of Mt. Maikang-Yepatori on the Cotinga, I found growing along the ground a flowerless succulent plant, in its whole conformation uncommonly like a *Mesembryanthemum* which covered with a matted felt the sandy spots in the village otherwise devoid of all vegetation, I nevertheless did not venture to take it for a species of the genus, the presence of which in South America was not yet known. All the greater then was my surprise, as I now re-entered the village, when my eyes fell upon thousands of the pretty dark red flowers covering the plants, and I really recognised the first representatives of this large genus present on this continent. On closer inspection they proved to be a new species, and received the descriptive name of *Mesembryanthemum guianensis,* Klotzsch.*

543. Our first and only care was to bring the luggage as quickly as possible under shelter, for which purpose we summoned all the Indians in the neighbourhood. In the course of 12 days the heavy transport over the shadeless savannah from a spot 17 miles distant was completed, and it was with many thanks that we paid our friends from Torong-Yauwise who had readily offered their services for the tiring work, their hard-

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* —The foot-note giving a technical description of the plant, in Latin, is omitted—(Ed),

earned wages which, as we only possessed a few articles of trade, was insignificant enough.

544. During this anxious period Tiedge's naive and sprightly descriptions of his lonesome life and of particular scenes that enlivened it afforded us infinite amusement, and often caused most immoderate laughter. This was especially the case with some of the adventures that he had to repeat more than once. Reference was made in one to his first meeting with several Brazilians who had put in an appearance soon after our departure from Pirara, and of whom he believed nothing less than that they had been sent to make a slave of him: then in another, the visit of some jaguars after the carcass of one of Mr. Youd's horses that had died quite close to the village and with which a number of other carnivorous animals had associated themselves: but the funniest of all was the story he told of a rattle-snake when to be sure he must have found himself in a tight corner. As he was just about to step out of his hammock one morning he noticed beneath it a large rattle-snake which, already rolled in a spiral, raised its head and spat out its tongue with every movement on his own part. The anxious prisoner was each minute afraid lest the dangerous creature would make its deadly spring. If he tried to escape by jumping out on one side, there lay the head of the animal in wait: if he attempted it on the other, its small piercing eyes were glaring at him. Every more than ordinary movement of the hammock only irritated the reptile, which raised its head and neck so much the higher. It was in this terrible situation, without weapons, and momentarily expecting the snake to spring, that poor Tiedge, frightened and bathed in sweat, had to spend two hours, when it first pleased the abominable creature to creep further away. Since this occurrence he had tied his hammock twice as high. Still more funny was his description of the fight he fought with the silent Tempter, who owing to the lonesomeness of the life was continually goading him on to broach the small supply of spirituous liquor that had been left behind: he had already several times seized one of the flasks, but just in the nick of time had been restrained by the conviction that if Satan once got his finger-tips, he would soon have possessed his whole body. With the object therefore of avoiding any further temptation, he had put the bottles in the darkest corner of the building.

545. On the day of our return, close to our house, I came into possession of a peculiar snake which, judging from its projecting upper jaw appeared to belong to the genus *Heterodon*, and on closer examination shewed itself to be really a new species of this interesting genus, and received the name of *Heterodon guianensis* Trosch.

546. Our arrival at the village was shortly afterwards followed by that of several of the former residents, and in general a day seldom passed but company came from the nearer or more distant settlements, occupied the quarters still remaining empty, and then went away again to make room for others. Included among such temporary occupants were certain Indians and the headman from Mari Village on the Rupununi, who brought us the sad news that the terrible scourge of small-pox had broken out at his settlement and that a large proportion of his men had already fallen victims to it. According to the statement

of the chief, who had come here in the hope of obtaining a remedy from us, the disease had been introduced into his village through some Indians who had accompanied the boat with the military to Georgetown. Although small-pox, at the time of our departure from the coast, was rampant among the Warraus and Arawaks, we nevertheless never believed that it would be carried so far inland. There was therefore unfortunately cause for fearing that the frightful epidemic would spread itself still more over the interior and yet further reduce the population already naturally scanty enough, because, owing to the nonsensical treatment adopted, barely two escape with their lives out of every ten affected. As in the case of measles they drench the small-pox patients during the most acute febrile stage with water, a procedure from which, in spite of all our protestations we could never wean them.* The earnest entreaty of the chief to give him medicine for his sick people, and the resolute faith in which he hoped for certain relief from it, certainly put us in a dilemma but nevertheless induced us to give him a little powder, which could neither harm nor heal, for each of his patients: we doubly impressed on him the importance of discarding the hitherto practised senseless method of treatment, and of protecting the sick from all draughts and chills. The piaiman of the village who, on the outbreak of the scourge, continued his incantations day and night, was the first to fall a victim to the disease.

547. We could not expect my brother back before the beginning of April and the oppressive scarcity of provisions would have proved still more trying had not the former villagers' respect for Mr. Youd guarded against it. In spite of its being universally known that their friend was dead, they had nevertheless carefully harvested his well-stocked maize-field and warehoused the product in his house. This abundant supply was all the more welcome because owing to the previous continual requisitioning of the military all the provision fields in and around Pirara had been exhausted.

548. We had noticed soon after our return that Stöckle was getting weary of this hand-to-mouth existence. The fellow, so cheerful before, now became intolerable, and really seemed to be seeking an opportunity to give us notice and return to Georgetown. The opportunity sought for soon presented itself. Mr. Fryer had given him a severe reprimand, and as his contract would be expiring a few days later, he told us that he wanted to get home. Grieved as I was to see so otherwise honest a fellow going, I had to let him have his own way. In the company of two Indians he went to Haiowa, from where some others brought him to Waraputa: there, as we learnt subsequently, he met my brother and Mr. Bernau, the latter taking him with him to Bartika Grove. Had the silly fellow only waited a few weeks longer he could have travelled to Georgetown in my brother's return boat for nothing, but every hour he remained longer than necessary made him the more afraid of wavering in his resolution.

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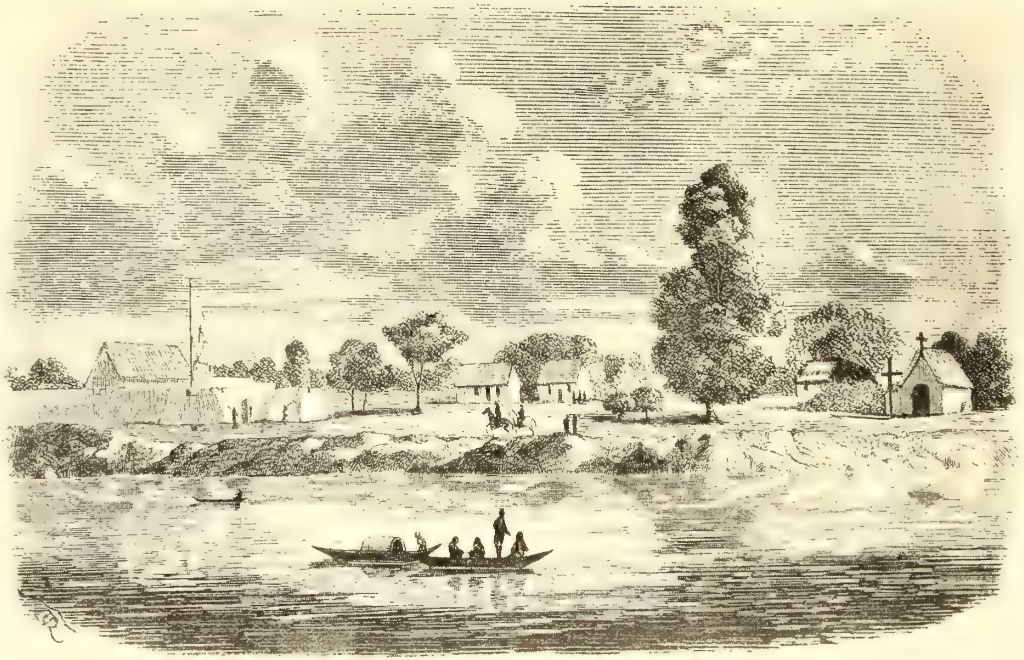
* The practice of using cold baths for fever is not so unreasonable as might appear, and is even now carried out and highly spoken of in the treatment of Enteric. (F.G.R.)



Fort Saô Joaquim am Rio Branco.

FORT St. JOAQUIM.

549. The unfortunate remnants of my rich collections of fish from the mountain streams of Roraima and Humirida, of scaly and smooth Amphibia and Insects—I had paid special attention to collecting all the different midges, flies, ants, etc.—were soon put in order. They were sad depressing days when the casks were opened for the purpose specified, because almost everything that had been collected at such an infinite cost of labour and of which I was so proud in the certain knowledge that at least two-thirds of it was new, proved to be rotten and spoiled and all the hopes that I had set upon this costly treasure, upon this witness of my bona fides, were destroyed. By its means I had thought of refunding all the losses entailed by its transport from the coast to England, and of counterbalancing the dissatisfaction already expressed in Berlin, and now after all to find that, through no fault of mine, the largest portion of the rare specimens were spoilt. The dried plants, owing to the moist temperature in the environs of Roraima, had also suffered a good deal, and many were quite useless. Only the living orchids had kept in tolerable condition and flourished quite vigorously in the shady spots where I had planted them at the time we left. Of such are the experiences, the reward, the sorrows and joys of a collector.

550. The days ran their course slowly and lazily. I had already made the most of the surroundings of Pirara in the botanical and zoological line, and only the visits of isolated parties of Indians now and again brought a little change in the relaxing monotony. All the more then did we welcome the sound of a strange voice that I heard in front of my house one morning. Inquisitive, I jumped out of my hammock and came outside the door, where I was met by four young men each with a pack on his back, and two of them armed with guns, who represented themselves as deserters from Sao Joaquim and asked us to help them in their flight to Waraputa. According to their own statement, they had left the Fort five days before, had continued their progress by night and hidden themselves in the oases by day. Partly to kill the game necessary to keep themselves going and partly also to pay for the assistance of the Indians in case it should be required, they had come away with their guns in addition to their uniforms. The famished figures, who unburdened themselves of their troubles and misfortunes, moved us to render them the assistance sought, and brave old chief Basiko (Vol. I Sect. 855) who, with a party of his men, happened to be with us at the time, likewise let himself be influenced by the promise of one of the guns to take them as quickly as possible to Mari, because it was quite intelligible that search would be first of all made for them at Pirara. Two days later Basiko returned triumphantly with the gun and with the information that at Mari some Indians had also been found who, with the promise of the second musket, had taken the four deserters on to Waraputa. Our conjectures proved only too true, because on the very day after Basiko's return Major Coelho in company with Captain Leal and a party of soldiers came to us on the look out for their men.

551. We had no reason to hide from the angered officers the fact that the four deserters had been here: we however antedated their presence by two days, so as to stop them being pursued further. It was lucky we

made a clean breast of the matter, because had we taken the opposite course our friendly relations might have received a substantial shock when, in the course of conversation with both officers over the very same thing, one of the soldiers came into the house holding the gun with one hand, and our friend Basiko with the other. Basiko had regarded the weapon as his lawfully earned property and had stood it openly in the house where it was immediately recognised by one of the soldiers on entering. Major Coelho and Captain Leal had now found an object on which they could vent their spleen over the ill-success of their expedition, and got into such a passion that they threatened to hang the poor old man. Of course, we strongly protested because Basiko had traded in absolute ignorance of the law and had done nothing further than to take four men, who had asked him, to Mari without making previous enquiry as to whether they had the right to go, and had received a gun for his trouble. The latter was naturally taken from him, and the anger of the officers soon appeased. Although Captain Leal apologised for the non-delivery of the farinha and arranged for the same to be delivered next day, it nevertheless never came.

552. We also learnt from these gentlemen that they were daily expecting the arrival at Sao Joaquim of the Boundary Commission, with a Colonel de Matoz at its head, who were to commence from here the mapping of the boundary line according to Brazilian claims. With the promise of shortly renewing their visit, both left us the following morning while we made all arrangements for bringing our three big corials, which were still at the mouth of the Pirara, overland to the Rupununi, a direct distance of 23 miles. This was finally accomplished after three weeks' trouble and labour with the active co-operation of Basiko and his subordinates. Forty in number we often made less than half-a-mile a day with our craft which were placed on rollers, for which the isolated savannah hills generally forced us to make a long circuit. At the end of the three weeks the difficult land-transport was completed, and we reached the waters of the Awaricuru to which we entrusted our naturally very much damaged corials. Their repair was left over until the arrival of the clever Hendrick.

553. With the completion of the transport, the hitherto numerous population of Pirara now took its departure: only a few stayed behind with us. This comparative quiet encouraged my hope of getting some skulls and skeletons which had hitherto not been possible, owing to the holy awe that the Indians cherish for their dead. The discovery of such a skull in my collections or even the evidence of its disinterment would have made enemies for ever of the men who were so truly devoted to us, and would have resulted in our becoming the objects of their revenge. The small number of residents and the peremptory orders of Mr. Youd that the dead were to be buried outside the village, prognosticated a satisfactory conclusion to my disinterment designs, in which Mr. Fryer promised to assist.

554. In addition to the graves in the small cemetery I still knew of two wherein a Warrau and a Maiong-kong were laid. The former had been a companion to my brother in his travels during the years 1835-1839

and had died at Pirara in a ghastly manner. Like all members of his tribe, he was very strongly addicted to drink: in order to have a real good fill of brandy for once in his life, he had stealthily slipped one Sunday out of the church where the whole company were assembled, had opened the cask of spirits put aside for prepared specimens, and started drinking to his heart's content. When my brother returned from service, he found the Indian lying senseless near the cask, out of which the contents were still running. In spite of all the remedies applied, the madman died in the course of a few hours and was buried in the neighbourhood of the village. It was on his skeleton that the first attempt was to be made.

555. I must confess that the nearer the appointed evening approached, the queerer I felt, and on the very day for carrying out our designs, they weighed like a heavy stone on my heart. It was not different with Mr. Fryer. Once, twice on our way to the grave-side, we stood stock still and had already made up our minds to turn back, when the thought that here I was missing the only chance that might present itself of fulfilling my wishes, forced me on. Mr. Fryer followed. We had soon dug a hole as far down as the body, and the skeleton was in our possession. The length of time had blackened the bones a bit. It is now to be seen in the Anatomy Museum at Berlin.

556. A few days later we took heart again and hurried with mattock and spade to the grave of the Maiong-kong, who also had died suddenly one night during my brother's previous visit at Pirara, and had been buried near the Warrau. Unfortunately we found the skull completely smashed to pieces. The avenging blow of an enemy's war-club had been the cause of his death.

557. Everything having up to now fortunately passed without discovery, we sneaked onto the little cemetery where lay the young Macusi, who had died shortly before our departure for the Takutu, and another who had died during our last absence. In spite of the remoteness of the spot from the village, an Indian who happened to be outside the house nevertheless heard the noise of our activities and had hurried to Mr. Goodall with the information that Brazilians must be nearing the village because he heard the stamp of horses. Although Mr. Goodall did everything he could to knock this idea out of the man's head, and assured him that it was we who had come into his house a little while before and had told him we were after a jaguar that had just put in its appearance, the wary Indian, to whom the sounds appeared so curious, was not to be prevented giving the few villagers the alarm. Meanwhile, after quietly completing our labours, which turned out to be much lighter than expected owing to the last Macusi having been buried only some four months before, we now, delighted at our success, hurried back to the village, to pack up our booty still at night just as unnoticed as the previous ones. The Macusi buried prior to our Takutu expedition, who must have lain about twelve months underground, proved to be quite a dried skeleton, and even the body that had been interred four months previously, was already devoid of all flesh. I need not describe the fright that seized us when, on getting close to the village we found the

whole of the residents gathered in front of it. Without reflecting any further—for a few loud remarks from Mr. Goodall had already notified us that we had been observed—we threw mattock, spade, and skeleton in the bushes, and came to meet the waiting group with the assurance that we had not found the jaguar we were after. It was lucky that a thick cloud just at that moment crossed the moon, for otherwise our frightened features would have at all events betrayed that we intended evil. At mid-night we both made a search for the skeleton in the brushwood: in the meantime I was glad when the wicked work was finally and successfully accomplished. With a real light heart I started next day on my trip to the Canuku Ranges where I proposed collecting young specimens or fruits of all palms present with a view to planting, because the fruits of the *Maximiliana, Mauritia* and *Astrocaryum Tucuma* that had been placed by me in roughly packed boxes before my departure to Roraima had sprouted splendidly and were growing up fine.

558. Heavily laden, I returned in eight days, put some new boxes together, and planted my collection out, which also soon began to flourish and compensated me for the loss of many another living plant.

559. Amongst such activities March was ushered in, and Major Coelho, under the impression that my brother had already returned from Georgetown, surprised us with a fresh visit. It was the 4th March when, after partaking of our frugal evening meal in company with the Major, we were engaged in active conversation outside the door of our quarters, and Mr. Fryer had asked us to look in the direction of W.S.W., that we observed a broad white nebular streak which inclined towards the horizon and rose to an altitude of 45°. For several days past the skies had been covered with clouds that had hidden the stars. An isolated bank of cloud that rose in the east and was tracking for the west soon hid in part the white streak in question that still remained visible in between the breaking masses of vapour and thus afforded the clearest evidence that it must occupy a higher altitude than the clouds which now and again concealed it. Opinions as to its being a meteor that was seen remained divided to-day. On the following evening, however, we recognised plainly that we had to admire one of the largest comets, that had yet set the world ablaze with fear and fright. We found the nucleus to be about 12 degrees above the horizon, while its tail extended up to star ν of Eridanus, which appeared at an approximate altitude of 15°. The broadest portion of the nucleus might amount to 1° 10′ and lost itself in the constellation just mentioned. Neither Mr. Goodall, Mr. Fryer, nor Tiedge remembered ever having seen a comet of such size before. While we were watching the sublime phenomenon in profound astonishment, it spread amongst the Indians a real panic of terror. Like a large proportion of Europeans they are wont to see in a comet the sign and forerunner of pestilence, famine, and calamity, at which we were not a little surprised. This superstitious fear expressed itself especially somewhat vividly some days subsequently to its ascent, when several parties of strangers brought us produce from their provision-fields, and the village once more developed scenes of greater activity than was ordinarily the case. Now, when night fell, and the comet was visible, everybody, man, woman and child, came out in front of their quarters and stretched out

their arms in attitudes of supplication and entreaty, to induce the awful apparition to leave the tent of heaven so that they might not perish under its influence. The Macusis called the comet Ca-poesima, *i.e.,* Fire Cloud, or Wae-inopsa, *i.e.,* Sun that darts its rays behind: the Arekunas on the other hand Wa-taima, and the Wapisianas Capichi, *i.e.,* in both cases, the Spirit of the Stars. The open savannah in which we happened to be was an unusually satisfactory point of observation. When we went outside the house of an evening to watch the glorious sight, the temporary inhabitants of Pirara gathered round us every time and enquired anxiously what the Paranaghieris thought about the Wae-inopsa and what name they applied to the fire-cloud. Up till the 20th March the comet shone in all its beauty, but from that date on it lost more and more in extent, and became ever more dull and vapory.

560. During these days of general fright and excitement for the Indians, I was offered the opportunity of admiring the almost marvellous self-control of the Indians and that too in a boy of at most 12 years of age. It was on one of those hot days in the dry season when one searches the cupola of heaven for a little dark cloud in vain, when the lower layers of air are seen in continual oscillation and all objects except, possibly, distant ones, have taken on the same movement, that we saw some Indians hurrying to the village and leading a boy in their midst. As they approached the settlement they hastened to our quarters and asked for help: the lad's whole body had been torn and flayed in a really terrible way with lighted gunpowder. The body, the face, in short, every bit of him was covered with curdled and partly already-dried blood-clots: the place where the eyes ought to be could only be recognised by a small depression of the swollen face: the whole appearance of the poor victim of imprudence was indeed heartrending. The people had visited us some days before, and in exchange for their provisions had asked and received a pound of gunpowder. On the morning that they proposed going to hunt they had placed the tin case containing the explosive close to the fire on which their breakfast was being prepared and around which they squatted: a spark lighted the exposed powder which thus blew up the boy into this pitiable condition. Although Umata village was eight miles distant from Pirara, the father and some friends had set out immediately after the accident with the unfortunate boy, and had led him under the broiling sun and through the open savannah to seek assistance from us. When one reckons what the pains of the wounded body must have been by themselves alone, and then the torments of the scorching sun, so must it indeed sound extraordinary enough when I maintain that not a sob passed the lips of the sufferer. Quiet and resigned, without any signs of pain whatever, the blinded youth stood before us. The only relief we could afford him was to anoint him regularly with oil, which we fortunately still possessed in sufficient quantity. Next morning the father went back to Umata and left his lad for further treatment which continued on the same lines. For ten days the poor youngster lay completely blind in the hammock slung for him: on the morning of the second day after recovering his sight, he had disappeared and returned home without having given us even a thanks or a good-bye.

CHAPTER IX.

Manners, Customs, Language of the Macusis as well as of other Tribes—Van Heuvel concerning El Dorado and Lake Parima—The Amazons—Amazon Stones—Diseases of the Macusis—Medicinal Properties of certain Plants and their Application—A Trader's unfortunate Speculation—My Brother's Return to Pirara—Tiedge's Return to Georgetown—Results and Course of my Brother's Journey from Our Village to Cuyuni—Junction of the Kukenam and Yuruani—Caroni—Basin of the Cama—Mt. Irutipu—River Cako—Basin of the Mazaruni—River Annawai—Sources of the Carimang—Cutzi—Musa paradisiaca in wild state—Kapoi-tipu and Warima-tipu Rocks—River Paruima—Kaurutipu Mountain Range—Basin of the Cuyuni—Cara-utta Rocks—Junction of the Carapu with the Wenamu—Sandstone Wall of Poinkawatu—Immapara Cataract—Territory of the Akawais—Junction of the Wenamu with the Cuyuni—Estuary of the Ekruyeku—Ekreku Mountains—Indian Fishing.

561. Our almost uninterrupted intercourse with the Macusis and the long time we spent in their territory had naturally made us better acquainted with their manners, customs and language and especially more intimate with their character than could possibly be the case with other tribes. Amongst the latter, owing to our stay being limited to but a few days or seldom longer than a few weeks, their languages remained almost wholly unintelligible, and we consequently as a general rule only got to know just so much of their social life that presented itself to our experience and observation: nevertheless the undoubted fact became apparent, even from this little, that just as the inhabitants of South America differ but slightly from one another in their build of body, so they fairly well correspond with one another, as regards main features, in their mental faculties and character. I do not consider it out of place therefore to sum up here my experience relative to the social, moral, and spiritual life of the Macusis and at the same time to specify the variations met with in other tribes.

562. I have already stated that the Macusis are one of the most numerous and powerful tribes in British Guiana, that they occupy the savannahs between the Rupununi, Parima, along the Pacaraima and Canuku Ranges to the number of about 1,500 souls, their whole membership possibly amounting to about 3,000, and that they are noted for their peace-loving, complaisant, gentle and friendly character, but especially for their love of order and cleanliness.

563. Buffon sketches the following characteristics of the occupants of South America: "Although the savage of America corresponds in his natural dispositions with men of the civilised world, this nevertheless does not weaken the contrary statement about the general degeneration of the animal organs in that portion of the world. Among the aborigines,

the organs of reproduction are small and weak: the beard and passionate love for the wife is wanting. More adroit through his nomadic life than the European, the latter is nevertheless stronger and more powerful. The savages' sensations likewise are all less vivid, except those of fear and cowardice: he possesses no vivacity, none of that sprightliness of intellect: his every movement does not arise from any inward impulse for action, but has to be specially forced on him by need and want: destroy the impulse for alleviating hunger and thirst and his activities have lost their motive: sitting or lying in his hammock he remains all day long in dull indolent rest. The reason for the aimless life of these people, their aversion to associate with their fellow-men is quickly discovered. The most beautiful spark of Nature's fire does not fall to their lot: they have no passionate love for woman, and hence no love for mankind in itself. Ignorant of the most beautiful and tenderest of the affections, all their sensations of this nature remain cold and dull: love for their children and elders is weak. All family ties are loose: no family feels itself bound up with the others. Hence also a union, a republic, a social state can never be formed out of them. Lust alone is the basis of the morality of their customs. The women are the slaves, the beasts of burden, of the men who pitilessly load them with the harvest of the chase, who force them to work without mercy, whose very strength is often far overtaxed. They trouble themselves equally as little over the few children which they possess.. All the above must be ascribed to this same absence of love for mankind. They are indifferent because they are physically weak, and this indifference towards the woman is the inherent blot that vitiates nature, and helps to hinder propagation, and so undermines the basis of society at the same time that it destroys the germs of life, with the result that man does not rise above what was said of him above. Nature denied him the full exercise of love, and thereby treated him worse and prejudiced him to a greater extent than the brute beast."

564. The whole of this characteristic is based upon theory, and not upon experience:—my description of this people which I mean to be exempt from all theorising and philosophising, will confirm this statement of mine and refute every one of the charges of the great naturalist.

565. If polygamy is indigenous among almost all remaining tribes of Guiana, it is only very rarely met with amongst the Macusis, and it was on this account surprising to me to meet among them not alone generally small families but also many couples without any children at all, so as almost to lend testimony to the view that in many cases women seek artificial means to prevent the progress of pregnancy. But when Buffon believes that the absence of children is accounted for by the want of passionate and amorous love between the parents, he makes a mistake. The husband loves his wife, and she her husband just as tenderly as can be the case among civilised folk, only that the former considers it indecent and effeminate to show this in the presence of another, on which account he despises those Paranaghieris who do not restrain their feelings in the presence of others. In front of strangers, especially Europeans, the Indian will simulate an almost icy indifference towards

his wife and children, just as he in general knows how to control all his feelings in the most masterly manner. But if the parents believe themselves unnoticed they smother their children with all those endearments of which the European alone is at all capable. I can call to mind but one instance where this outward decorum was not observed: a couple, already married for over a year, and who accompanied us on the Takutu expedition, gave free expression to their feelings of fondness in our presence.

566. And if I also wished to reject as untrue the reason given by him as the obstacle to pregnancy, there are a number of other circumstances other than those such as indifference and impotence that would rather account for the certainly surprising paucity of children. The heavy work in the field and in the household, the restless fondness for travel when the women have to act as carriers of utensils, articles of trade, and provisions, the oft prevailing want of the necessaries of life, and their exhausting labours are without doubt the chief cause of sterility. This is confirmed by the fact that Indian women who marry Europeans, which is very often the case on the coast when they are then subject to neither of those fatigues, nor privations, become mothers of a numerous family. However reluctantly I might accept the assertion made against my will that pregnancy is often prevented by artificial means, it appears to me that a still further ground for this detestable practice may lie in the burden of the labour imposed upon the woman, as well as in the vanity so universally peculiar to her sex. because her work and trouble is increased with each new-born child and all traces of her former beauty which her first child may have left will completely disappear after repeated confinements. Such expressions as "You have beautiful soft eyes and a lovely forehead," or "What a pretty setting of your eyes" give rise to similar emotions in the Indian girl as flattery in the heart of a German coquette. Twin-births are extremely rare, and during the whole of my stay among the aborigines of Guiana I can only call to mind two cases of twins, among the Macusis and Waikas, which at the same time contradict another statement that when twins are born, one of the children always get killed by the mother, so as to avoid all suspicion of infidelity to her husband, as well as the chaff from the other women. This chaffing of the mother is also not customary among the Macusis and Waïkas: it would refute the soft and gentle character of the former.

567. When we told the women that among the Paranaghieris, twin births were anything but rare, and that cases even occurred where women gave birth to three at a birth, they put on a satirical smile and every time retaliated "We are no bitches that throw a lot of pups at a time." Their ideas of female chastity are of course heavens-away different from ours. Every girl may, without in the least damaging her reputation, favour heaps of lovers, but as soon as she is married, the most inviolate observance of marital fidelity is, as already stated, demanded of her. In the freedom above mentioned, in the liberty of undisputed control over their own bodies, the aborigines of Guiana correspond entirely with the natives of New Zealand, as reported in Cook's,

Forster's and Diffenbach's voyages, though the debaucheries of which the female sex were guilty with the sailors on the first arrival of the Europeans are entirely foreign to the Indian women of Guiana.

568. As soon as the mother feels that she is about to be with child, she betakes herself to the near forest, to the provision field, or some unoccupied hut and is confined there without any assistance. The navel string is cut by the mother or sister of the parturient woman, and tied with a cotten thread: if the new-born babe is a boy, the cutting is done with a sharp-edged piece of bambu: if it is a girl a piece of arrow reed (*Gynerium saccharoides*) is used. With the deepest and most sacrificing love the mother clings to the young citizen of the world from the moment it draws its breath: the murder of an actually born child by its mother is a thing unknown, and the killing of an infant by its grandfather, which happened in Pirara shortly before our arrival, commanded the most universal horror. Aberisto, the Brazilian already mentioned (Vol. I, Sect. 860), had lived in polygamy at Pirara and seduced one of the prettiest girls in the settlement, Tokuipa. (Tokui is the name given by the Macusis to the different species of *Galbula.*) The latter resided in the house of her father who had not yet overlooked her fault for having given herself away to a "Caraiba" and was always being reminded anew of his daughter's frailty by the continual crying of the child. One evening when the noise could not in any way be stopped by its anxious mother, the angered grandfather jumped out of his hammock, seized his cutlass, and with one blow split the infant's skull. Aberisto buried his child's body under the large cross in front of the church. Tokuipa often told us about this bloody deed of her father's.

569. After baby's birth, the father hangs his hammock near that of his wife, and keeps child-bed with her until the navel-string falls off. During this period, the mother is regarded as unclean, and the husband, before commencing his share in the ceremony, must, if he possesses no special house for the reciprocal lying-in, separate his bed from hers by a palm-leaf partition. Neither the father nor mother may perform any work: the former can only leave the house of an evening momentarily. The usual bath is forbidden him, and he dares not touch his weapons. The two of them may only quench their thirst with luke-warm water and their hunger with pap or cassava bread, which has to be prepared by one of the relatives. Still more extraordinary is the prohibition not to scratch their body or head with the finger nails, for which purpose a piece of the leaf-rib of the Cucurit palm is hung close to the hammock. The neglect of these orders and prohibitions will entail the death or life-long sickness of the infant. Another thing with them, the descent of the child, as in the remaining Guiana tribes, is derived through the mother: if she is a Macusi, but the father a Wapisiana, Arekuna, etc., the children are Macusi.

570. Before the married couple keep child-bed the infant is "blown upon" by the relatives, and when they have finished keeping it, the grandfather or grandmother give him a name customary to the family. If neither of them are alive, the duty falls upon the father as also does

that of piercing the ears, the lower lip, and the nasal septum in earliest youth. From the moment of birth, up to the time when the child can trust itself on its feet, the mother is rarely seen without it: it is until then an integral part of her ego. In spite of the most tender love, one never sees the mother kissing the child, and hardly ever hears her giving it those pet-names which with us are ever on the maternal lips. Their love appears to be more serious: they pay attention to more important things. In spite of the manifest love of the father for his children, he is nevertheless not above selling them, in spite of the bitterest tears of the mother, to another, perhaps childless couple. With unchanged countenance the boy or girl stands beside the father, listens quietly to the sale, and follows its new parents without demur. The price of a child is the same as that which the Indians ask for a dog, *i.e.*, a gun, an axe, or the like, in addition to which the purchaser must give the relatives of whom a number will acknowledge themselves as such, some knick-knacks, beads, etc.

571. Education of the boys is limited to instruction in swimming, fishing, hunting, the manufacture of weapons and other essentials. The girls are taught household duties by the mother. Chastisement, like punishment at all, is unknown to the Indian: only the dog, not the Macusi, requires a beating.

572. The mother keeps her child at the breast as long as it suits it. Should the family increase the grandmother takes over the duties of the mother towards her grandchild, and I often saw quite strong boys stand suckling at their mother or grandmother. In the largest proportion of cases the duty also falls on the latter of rearing the young mammals found by the husband or son. When I expressed my surprise to Sororeng at this extraordinary phenomenon he told me that the women employed a means whereby the milk was retained to a very old age.

573. When the boy reaches puberty, the mother troubles no further about him: he has become a stranger to her.

574. At the first signs of a girl passing from childhood into maturity, she is removed from all intercourse with the occupants of the house: during this intermediate period she is unclean. The hammock of the incipient young woman is taken out of its row and hung up in the very top of the house where the poor creature is exposed to the whole of the smoke which, where possible, is further increased. In the first days she must not leave her hammock in the daytime: she is only allowed to come down from here at night, to sit at a fire lighted by herself, and to pass the night beside it, or otherwise she will get a lot of nasty ulcers in her neck, a goitre, etc. So long as the most active and striking symptoms of the physical changes are in evidence, she remains subject to the most stringent fast. When these are over she may come down from above and move into a small compartment, which in the meantime will have been set up in the darkest corner of the building. Of a morning she may cook for herself in a particular pot, at a special fire, the cassava meal pap, which during her entire seclusion forms her only nourishment: this lasts for some ten days when the piai appears and exorcises her and everything with which she has come into contact: he mumbles and blows

upon the young woman and the more valuable things. The pots and drinking cups which she used are destroyed, and the pieces buried. But a painful ordeal still awaits her. On her return from her first bathe she must sit during the night upon a stool or stone where she will be beaten by her mother with thin switches, without daring to utter a cry of pain that could wake the sleeping occupants of the house, an event, the consequence of which would only mean danger to her future welfare. This flagellation again takes place at the second menstruation, but after that, no more. The girl may now be seen again among her people: she is clean, and if she has already been betrothed, the bridegroom comes on the following day to the house and takes his young wife home: in none of the tribes does this happen before puberty.

575. Again, the wife and daughter, with each recurrence of this physical process are considered unclean: during these periods they must neither bathe nor go into the forest, because they would then be exposed to the amatory advances of snakes.*

576. At first when I was still unacquainted with the habits and customs of these primitive people, the seclusion of a girl or woman in a compartment or up under the roof naturally surprised me, and I sympathetically enquired what ailed them. "Hure-puryia-purawanna-yenépé-pupei wanna" (I am sick, I have head-ache) or "Hure-puriya-purawanna yenépé uyé wanna" (I am sick, I have tooth-ache) was the usual answer.

577. Marriages are celebrated among the Macusis with just as little religious observance as among the Warraus and Waikas, and are very often already resolved upon at a very early age by the parents; under which circumstances, the young man is bound to work for his future wife's parents until such time as she becomes mature. This kind of betrothal is nevertheless by no means binding, for the affianced couple may break off their engagement at incipient puberty, and make another choice. During this courtship, the would-be benedict pays his youthful bride every attention, presents her with beads, and gives her the best of everything he gets in hunting. If she becomes his wife, he then carries her away to where he intends settling, and from henceforth his will is hers. Before, however, taking his wife away, he must submit to certain tests to show that he can uphold the title of "man." These trials, which are not always identical, include, amongst others, the cleaning, within a specified time, of a measured piece of timbered land which will subsequently serve him as provision-field, the felling of some huge tree within a stipulated period, etc. If he comes out of all these ordeals successfully, he earns the attributes of a man: he can appear at the assembly of the men and take part in their deliberations. Should he fail, he will have to make another try later on.

578. If no previous mutual understanding on the part of the parents has been come to, then the young man and maiden follow their own unrestricted inclinations. After the swain has given sufficient evidence of his mettle, his skill in hunting and fishing, and in tree-felling, he goes to

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*—The snake plays a very important rôle in connection with sexual matters. See Roth's Animism and Folklore, etc. sect. 347, pp. 369—370. (Ed).

the father of the girl chosen and in a subdued tone of voice asks him for his daughter: a few presents made beforehand constitute the preliminaries for the declaration: the consent of the father and daughter is a certainty, so long as the suitor is known as a courageous fighter and a good hunter and fisherman. It is only extremely rarely that a young man will betray his feelings for the girl of his choice before earning for himself a certain reputation in hunting and fishing or by way of some other physical superiority, for he would be scoffed and ridiculed not only by the old women but also by the girls. Should he return from the chase richly rewarded, he strides into the village with proud step and flashing eyes: he is well aware that all the girls are looking at him and trying to outdo one another in their praises of his prowess. Even the women who may still be in their houses are called out to admire the keen huntsman with his quarry. But when his luck is out he sneaks into his quarters like a thief at nightfall to avoid the scoffing and sneering whispers. Often enough we or the officers made sport and told the beauties of Pirara that we should like to have them for wives: the answer to our proposition was on every occasion, "Of what use are you to us? you who in four weeks have hardly been able to shoot a deer or a duck, and have caught no fish. You Paranaghieris do nothing all day long but look at your drying papers." If the youth obtains consent he betakes himself with all his property to the residence of his would-be father-in-law to whom he devotes all his energies, and for whom he hunts, fishes and fells the trees for the provision field. He is only allowed to give to his own parents such time as may remain free.. Should the young man complain of the extra work, or not appear industrious enough, some such sarcastic expression on the part of the girl's father as "Much obliged for your work. Let your reward be that I had *promised* you my daughter, etc." indicates that the mutual engagement is broken. The husband is free to get rid of his wife even subsequently, indeed, even sell her, which only in rare cases draws any unpleasant consequences upon the outcast, because often already by evening she will have found another husband. If the couple possess any children a separation of this nature is extremely rare and can only be dependent on infidelity.

579. The uncle on the father's side may not marry the niece because she is regarded as next of kindred to the brothers and sisters, for which reason he is also called "Papa." On the other hand he is allowed to make ties with the daughter of his sister, the wife of his deceased brother and his stepmother when the father is dead. Among the few examples of polygamy that I encountered among the Macusis, I found a case where an Indian had three sisters for wife.*

580. I have already several times mentioned the ceremonies that take place at death and burial, and would only add here that the widower must mourn his wife for from 9 to 11 months, *i.e.*, until the cassava-field and roots planted at the time of death can be made use of at the accustomed paiwari feast that is always celebrated prior to the second marriage. In spite of their naturally gentle and meek character, I was nevertheless very deeply grieved at the neglect and loveless handling of their

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* On the upper Pomeroon, at Issororo I knew of an Akawai living with three sisters. (Ed.

sick, and I can only account for this custom so generally present among the aborigines of South America by the religious conviction according to which the spirits of the dead haste to a spot where they will find all that they wish, all their friends who have gone before. For the rest they refer the good and bad to one and the same place. When I told them this might not be satisfactory I got the reply every time "We know nothing else, we have heard from our forefathers that all spirits get there." Some tribes of the Orinoco fix a more pleasant spot* without being able to define it more clearly, for those who were good in life: the wicked ones come to a tree wherein burns a continual fire, but if they sing, say the medicine-men, certain songs acceptable to the Supreme Being, their spirits fly over it and away without danger. The Otomacs maintain that the spirits of all hurry to the west, to a place where they can live in repose without trouble or work; a huge bird, known as the Tighitigh, the enemy of mankind, that begrudges them their occidental paradise nevertheless encounters them beforehand and accordingly seizes and swallows them as soon as they neglect to show a bold front. The immoderate lamentations of the survivors at the onset of death stand out in curious contrast with the preceding absolute neglect of the sick.

581. I have already, during the course of my narrative, mentioned something about their remaining religious convictions, their connection with a Supreme Being, and his position as regards man, as well as their views on the whole of creation in general. As with Caribs and Arawaks, the Supreme Being, the Creator of Heaven and Earth, is called Makunaima (One who works by night), the One in opposition being Epel, just as their cosmogony almost exactly tallies with that of the Warraus, Caribs, and others. After the great and beneficent spirit Makunaima had created the earth with its plants and timbers, he came down from on high and climbing a tall tree, cut away with his mighty stone axe some pieces off the bark, which he threw into the river coursing along below and thereupon changed them into all kinds of animals. When he had called all these into life he made man. The latter fell into a deep sleep and when he woke he found a woman standing by his side. The Evil Spirit obtained the mastery on earth, and Makunaima sent great floods: one solitary man escaped in a corial from which he despatched a rat to see if the waters had subsided, and it came back with a maize cob.†

582. The cosmogony myths of the Arawaks differ essentially from these in their main features. According to them man and woman were created by two different higher Beings. The creator of Man they call Kururumany,‡ that of woman Kulimina. Kururumany is their good Being, from whom good alone proceeds. When Kururumany once upon a time came upon the earth to see what the people were doing, he found they had become so bad that he wanted to kill them: he accordingly took away their everlasting life, and conferred it on those animals that change their skins, *e.g.*, snakes, lizards and cockroaches. Aluberi,‡ the Highest

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* P. Salvator Gili "Saggio di Storia naturale, civile e sacra, etc." Roma 1782.

† The correspondence of this with the Biblical story only too clearly establishes the influence of indirect missionary or other Christian enterprise. (Ed.)

‡ These are the tribal heroes Kororomanna and Haburi (Alubiri) of which detailed accounts are given in Roth's Animism and Folklore etc. (Ed.)

Being, but who does not worry himself about mankind, stands above Kururumany, the tutelary god of the Arawaks. Wurekaddo and Emisiwaddo are the wives of Kururumany: the first word means also "Some one who works in the dark," while the second is the name of the Cushi-ant and signifies "some one who rakes up the earth." A similar myth is found among the Tamanacs, a tribe living on the banks of the Orinoco.* Their Supreme Being on whom all things depend, is called Amalivaca. He has a brother Voeci: both together created the world: when they made the Orinoco a long discussion arose how to fix up the tidal effects so that the paddlers would always be able to travel up and down it, instead of tiring themselves out by pulling against the current. Amalivaca, however, had a daughter who was fond of going for a walk, so he broke her legs to break her of the habit. After Amalivaca had lived long with the Tamanacs, he used a corial to take him to the farther side of the salt water whence he had come. As he was just on the point of leaving, he called out to them in an altered voice: "You will change your skins," *i.e.*, "You will always keep young, like snakes, cockroaches, etc." A doubting old woman, however, cried out "Oh," which annoyed Amalivaca so much that he now said "You shall die."

583. The Maipuri, another tribe of the Orinoco, called their Supreme Being Purrunaminari: he made the men. His wife is Taparimarru, and his son Sisiri. Taparimarru was a beautiful young woman. Purrunaminari fell in love with her and his desires, without any physical contact, made her the mother of Sisiri.

584. Remaining traditions which Gili relates of other tribes bear like the last mentioned, an apparently evident Christian mixture, for which reason I do not refer to them further. In this category I might also mention the traditions of the Warraus according to which a woman who flew through the air and, without having had anything to do with a man, gave birth, in the neighbourhood of the Orinoco, to the first Warrau, from whom all other tribes were derived.

585. The Maipuri again, and according to Alexander von Humboldt the Tamanacs also, have a legend that once upon a time the whole earth was flooded with water. Only two people, a man and a woman, saved themselves on the summit of the high mountain Tamanaku. As they wandered round and round in deep misery at the loss of their friends, they heard a voice instructing them to throw the *Mauritia* fruit over their shoulders behind their backs: this done, the fruits that the man threw became men, and those that the woman threw, women. According to the myths of the Macusi the only man who survived the general flood threw stones behind him, and by that means populated the earth afresh.

586. Amongst all the tribes that we became acquainted with, it was the aged women who take the part of the old-time bards, and transmit these traditions from one generation to another.

587. I have also nowhere found the slightest trace of idolatry or fetishism. All the forces of nature are the outflow of the Good Spirit so long as they do not interfere with the repose and comfort of the Indians:

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* P. Salvator Gili *op. cit.*

they are the activities of the wicked ones as soon as they do. I have already detailed separately the influence and power which the piai exercises over evil spirits. Granted that logical connection is wanted between all these religious convictions, granted the absence of all those ceremonial and outward forms through which Belief expresses itself, I must nevertheless maintain that the Indians in their simple faith approach Christianity far more closely than all those Asiatic people with their affected and fantastically adorned systems of religion, and that, if at the present moment so little of it has taken root amongst them, it is their confessors and missioners who are most to blame.

588. As with other tribes, so with the Macusis, every settlement is presided over by a chief whose power of authority is already known to my readers. He fixes the dates for the sports, dances, etc., gives the orders for food and drink to be set before the guests and calls the inhabitants of the settlement together in council as soon as the general welfare and common interest demand it. He never gives his orders in an imperious manner, but always submits them as it were to the free resolution of his subordinates; he asks them whether they ought not perhaps to do this or that, etc. But in battle he is absolute ruler. Every Indian, on returning home from a hunting or fishing trip sends him a portion of the catch as a present.

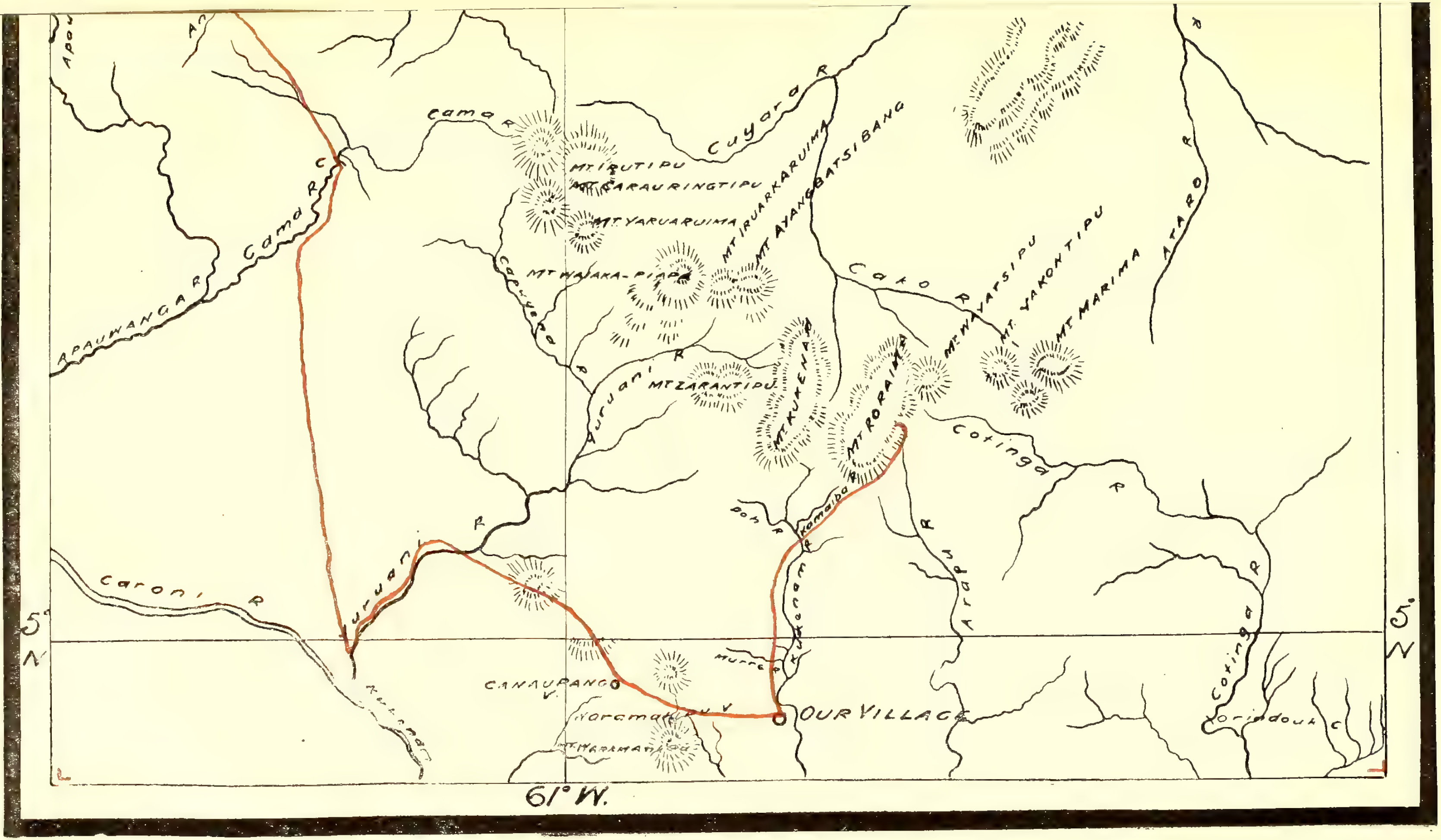
589. In times of peace the chief has but little to decide. The property of every individual—be it a house, a few household effects, or the provision-field,—is sacred: any violation of this, except in war, is well-nigh impossible, and contentions over Mine and Thine are consequently extremely rare. Should they however arise, the Palaver (Council of Men) summoned by the chief, decides the matter, and the contending parties submit to its decision. Every insult to one's honour, wife, or child, is generally washed out by blood-revenge, without being brought before the People's Assembly for review.

590. The outbreak of hostilities is not preceded by any declaration of war: except that as soon as war is determined upon by the Palaver, the side taking the offensive tries to get as close as possible to the enemy at night, with a view to making a surprise attack by daybreak. But the watchful dogs often betray such a manoeuvre with the result that the besiegers are received well-armed and prepared by those attacked. Should the latter feel themselves too weak, they take to flight without even making show of a fight, but leaving behind their sick upon whom the disappointed enemy cool their revenge: they also destroy the village. Among the coastal tribes where the river beds exposed to ebb and flow constitute the highways, the attack will depend upon the tide. If the attacking party goes up-stream, this is done only when the water washes, when they can trust their corials to the current so that the noise of the paddling can hardly betray them. So also, when the attacking force have to travel down-stream the expedition only takes place at the ebb. If during their course up or down, they should be met by ebb or flow, or day should break, before reaching their goal, the corials are quickly

sunk in the water, and at nightfall pulled out and the journey resumed. The warriors also hide themselves in the forest and carefully avoid doing everything that might indicate their presence.

591. If the contending forces meet in the open, action begins with a war-dance, wherein the enemy challenge their opponents with a number of contortions and gesticulations, both parties trying in general to influence each other's passions by singing at one another with lampoon and sneer. The combat starts only from a distance with poisoned arrows, of which each warrior takes seven to battle. When these are shot the fight continues with war-clubs and indeed man against man. If one side withdraws, it tries above everything else to rescue its dead, so that these should not fall into the hands of the enemy, a business that is imposed upon the women who accompany the men like pack-animals and constitute the camp-followers. As implicit obedience has to be rendered the chief in war-time, he is distinguished by a brilliant feather-decoration, finer weapons, and a particular kind of body-painting. The warriors are also painted on such occasions differently from what they are during peace: their hair is thickly covered with rucu and feathers stuck on it. Georgetown residents can even yet recall the peculiarly gruesome spectacle that presented itself at the last revolt of the Negroes when the nude thrillingly painted and fantastically ornamented Warraus, Caribs, Akawais and Arawaks were reviewed on the parade ground prior to the expedition against the blacks, while their women, loaded like beasts of burden with weapons and provisions, formed the rear-guard.

592. This being the life-history of the Indian in general, the question may now be asked, what is he like individually? and again here I cannot regard Buffon's characteristics (sec. 563) as having been anywhere confirmed. I readily admit that my experience of the Indian led me to form an opinion of him different from what I had previously held, based as it was upon the accounts given by highly poetic souls: but he is certainly not the lazy, unfeeling, indifferent cowardly yokel that Buffon describes him. A certain bias to indolence rules him of course to a higher degree than it does Europeans, or the Indians of North America, but the clod of his native home, not his want of strength of mind, is the chief reason for it. Like all people who are still approximating their primitive condition, they are both passionate in love and passionate in hate: but the individual never carries his heart in his hand: he conceals both feelings from the eyes of his fellow-men, and most of all from Europeans. The man who can hate like the Indian so that nothing can hinder or divert him from the gratification of his passions, so that to revenge himself he climbs mountains, forces his way through almost impenetrable forests, and gladly suffers all the hardships, such as hunger and thirst, that come in his way,—must at the same time be passionate in his love: it would be a psychological anomaly otherwise. It is true the Indian is taciturn, but only taciturn in the presence of strangers, especially the European, because he is proud. The European sees no tears in the eyes of an Indian: the latter's pride knows how to control the outward expression of such feelings. When the Indian is alone with his tribal relatives, when he has learnt to esteem


Apou
Ar
Cama R
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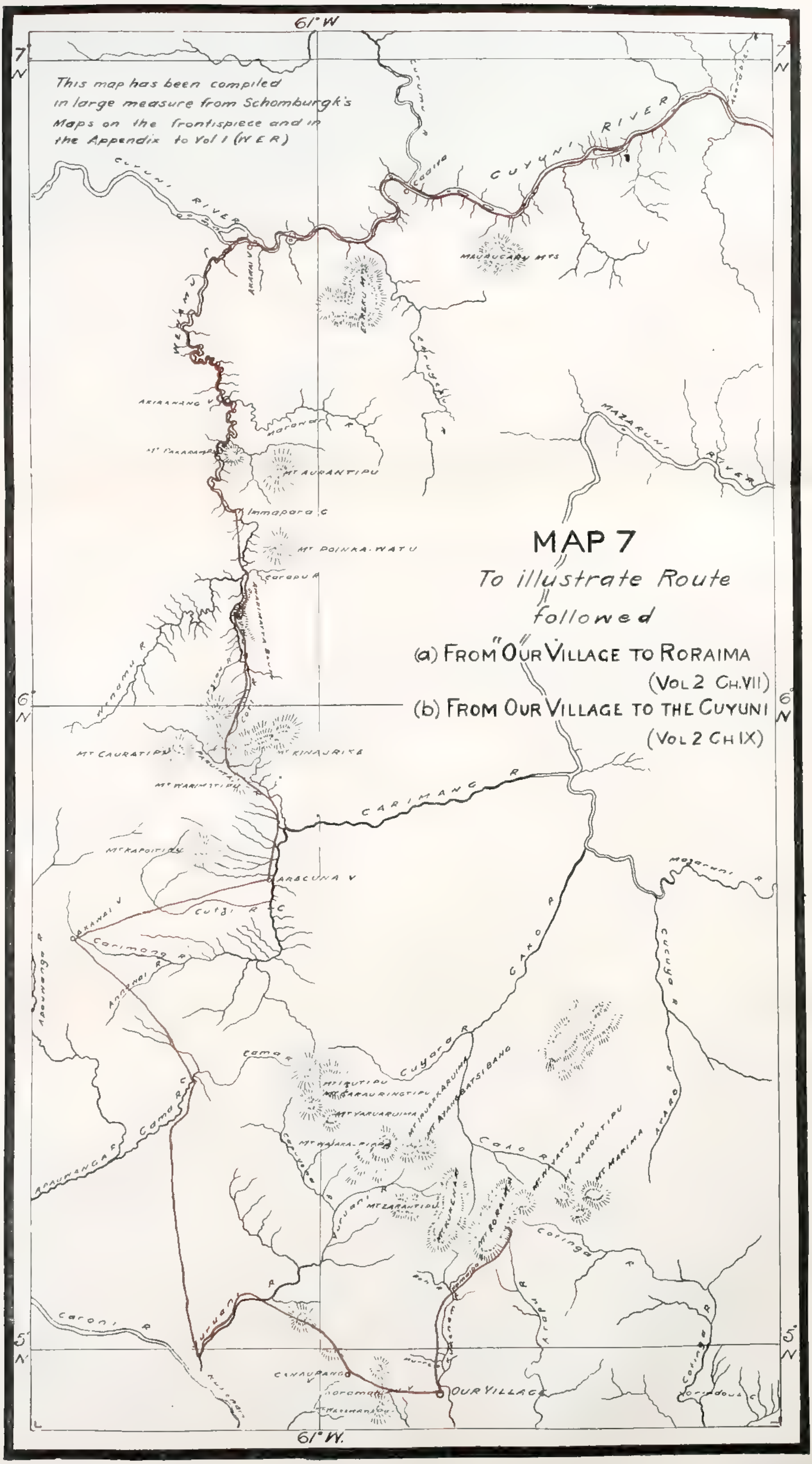
Cama R
APAUWANGA R
Cuyara R
MT. IRUTIPU
MT. ARARAURINGTIPU
MT. YARUARUIMA
MT. IRUARKARUIMA
MT. AYANGBATSIBANG
MT. WAIAKA-PIAPA
Capuyera R
Yuruani R
MT. ZARANTIPU
MT. KUKENAM
MT. RORAIMA
MT. WAYARSIPU
MT. YAKONTIPU
MT. MARIMA
Cato R
ATARO R
Cotinga R
Caroni R
Kukenam
Yuruani
R
Pon R
Komaiba R
Kukenam R
Arapu R
Murre R
CANAUPANGO V.
Yoramatapu V.
OUR VILLAGE
Cotinga
Orindouk C
5° N
5° N
61° W.

V. ROTH, del.



MAP 7

To illustrate Route followed

(a) From "Our Village" to Roraima (Vol 2 Ch. VII)

(b) From Our Village to the Cuyuni (Vol 2 Ch IX)

This map has been compiled in large measure from Schomburgk's Maps on the frontispiece and in the Appendix to Vol I (W.E.R.)

61° W
7° N
6° N
5° N
CUYUNI RIVER
Cuyuni River
Caoiro
MAURUCARU MTS
ARAKAI V
WENAMU
AKIRANANG V
Moronar R
MT PAKARAMPA
MT AURANTIPU
Immapora C
MT POINKA-WATU
Carapu R
MAZARUNI RIVER
Wenamu R
MT CAURATIPU
MT KINAJURIKE
MT WARIMATIPU
CARIMANG R
MT KAPOITIPU
ARACUNA V
Cutzi R
AKANAI V
Carimong R
Annanai R
Abourango R
Mazaruni R
Cucuyo R
CAKO R
Camo R
Cuyara R
Camo R
APAUWANGA R
MT IRUTIPU
MT KARAURINGTIPU
MT YARUARUIMA
MT IRUARKARUIMA
MT AYANGBATSIBANG
MT WAJARA-PIPPA
Cako R
MT NAYATSIPU
MT YAKONTIPU
MT MARIMA
Arabo R
Suruani R
MT ZARANTIPU
MT KUKENAM
MT RORAIMA
Coringa R
Arapu R
Caroni R
Suruani R
Coringa R
CANAUPANGO V
OUR VILLAGE
Oorindous C
61° W.

V. ROTH, del.

the European, he equals the Frenchman in vivacity. Half the day they spend in discussing their adventures in the chase, as well as other things. A dull stupid fellow can never be a mimic or a humorist, and yet both talents are peculiar to almost every native. If a stranger comes amongst them, curiosity compels the Indians in the neighbourhood to come and look and make comparisons between him and themselves. With sharp and critical gaze each one notes the new-comer's demeanour, his every movement, listens to his very words, and now and again casts a significant side-glance at the friends standing around: no item escapes him, but he betrays nothing of the triumph which he already inwardly experiences. Accompanied by his companions he returns to his quarters where, bubbling over with fun, judgment is passed upon the stranger in the most biting satire, and his portrait sketched. "His nose is as long as a tapir's; he has a mouth like an alligator, and he bolts his food like a tiger; his legs are as lean and ugly as a Tararamu (*Mycteria*) and his belly as shrivelled as a monkey's, etc." So also after we had spent the first few weeks among the Macusis, each of us got a nickname with which they distinguished the one from the other. Mr. Fryer, on account of his size and long feet, was Tararamu: Mr. Goodall, who often read the prayers at service, Domini: Stöckle, on account of his fair hair which seemed specially ridiculous to them, Arauta (Howler monkey): Tiedge, on account of his long nose, Itéung yaneng (long nose) or Maipuri: while me they called Yariko-papa (Flower father) because I was always carrying flowers about. Just as the stranger suddenly got a nickname, so also did every one of the Indians who at any time had suffered some physical damage or peculiarity: Long-hair, Long-head, Pointed-nose, Thick-neck, Bent-leg. If anyone is good at climbing, he is known as Tiger cat: if he can run well he is generally called Deer, Arrow, or Lightning. As in the case with the men, so also with the women: Thin or Flat-legs, Limpy, Big-belly, Red-lip, Squint-eye, Pretty-eye, Long 'un, and Curly, are some of the names that I came to know. But this only by way of example.

593. Equally active are all their intellectual powers but still more worthy of admiration are their memory and the ease with which they make foreign languages their own. People have reproached the Indian for being ungrateful, and I myself also thought so at first. To be sure, his language possesses no name for gratitude: with unchanged countenance he mostly accepts a present, but he forgets it even as little as the injury which one inflicts on him: years after, it is not too late to show it. What their eyes see their hands venture to undertake, their minds grasp for a life-time: but their mental faculties do not rise above the perceptions of their external senses: everything transcendental remains remote from them: they are real disciples of knowledge gained by experience.

594. The Indian is vain, proud and ambitious. Certainly these passions are circumscribed by the limited circle of ideas in which he moves: but give him a wider sphere of action and his ambition will still stand the test. His pride at present finds satisfaction in the qualifications and adroitness which are within his reach according to his circum-

stances: he will search for it in nobler things as soon as his ideas are broadened, as soon as he becomes conscious of his talents and of the fact that the veneration, respect and, I might almost say, holy awe with which he regards the European is nothing more than the effect of the still unknown sensation of the former's spiritual superiority. Indians overcome this feeling as soon as the latter become guilty of the weaknesses to which they are themselves subject.

595. Were I to turn now to their language there were certainly two obstacles which it was not in my power to remove, that perhaps stood in the way of my having anything in common with this obscure subject: these were the shortness of my stay amongst tribes whose languages differ so repeatedly from one another, and my want of all the scientific qualifications necessary for such enquiries to bear good fruit and not to increase still further the confusion already ruling it. The manners and customs of the Guiana tribes show striking analogy with many Asiatic people, little or hardly anything with western ones. The same with their language. A folk that only possesses scanty traces of tradition and myth, and no documents, the history of the Indians is a labyrinth, the thread is lost, and even philologists will find it hard to pick up again. What I am submitting here constitutes but grains of knowledge gathered during my intercourse with the aborigines, barely even a poor contribution for future reference, but perhaps an inducement for some scientifically trained man to fix the neglected and scattered stones together and form a structure that will put life into the hitherto desert area. Associated with the difficulties already mentioned is the almost practical impossibility of learning the language by enquiry, because one finds the Indians only for a short time willing to answer questions relative to the language. All queries involving its structure, its flexions, conjugation, etc., remain a blank to him: they carry him to an uncultivated field, he looks at the questioner mutely for some minutes, shakes his head, comes out with a "H'm" and, to give perforce but a momentary reply, goes away. What I was able to collect concerning the language consists only of a number of words which I will arrange in the appendix and a few quite general grammatical rules.

596. I have already several times mentioned that it almost seemed as if Guiana possessed as many languages as it numbers tribes, of which only a few might be regarded as dialects of one and the same tribal language: for the reasons just given, however, I cannot express any definite judgment. The radicals amongst some of the tribes naturally show similarity not only of sound, but also of meaning, whilst in others again they are entirely different, with the result that some tribes do not understand one another, except by pantomime, as in intercourse with Europeans, which remains their only medium for mutual understanding. However similar the autochthonous inhabitants of Guiana are in figure, features, inclination, habits and customs, the differences of language striking upon the ear must at least be all the more extraordinary. It might possibly be the case that all the languages of the Guiana tribes can be traced back to those of the Caribs, Arawaks,

Warraus and Wapisianas. Their wealth of language is equally as limited as their sphere of ideas: it comprises only what is to hand, only what is perceptible through their senses and feelings. Everything that relates to the abstract is foreign to them, and they possess but an exceptionally small number of words for it: the verbal expression of abstract ideas is outside their vocabulary. Everything that they first learnt to know through Europeans, particularly the Spaniards, has retained the name given it by the people through whom they became acquainted with it. Such names, with isolated unessential alteration of letter or addition of syllable are common to all the tribes, the reason being that they have spread, for the most part, from the one that first came to have a knowledge of them. Thus, all the tribes of Guiana call money *Brata* or *Blata* (silver): paper, *Carita*, from *Carta* (letter): shirt, linen, cotton, *Camisa*: hat, *Sombrero*: shoe, *Zapato*: gun, *Arakabusa*: powder, *Crubora*, also *Polvora*: shot, *Piroto* also *Bala*: horse, *Cavari*: cattle, *Vacca* or *Bacca*: goat, *Cabrita*: pig, *Puenka* (from *Puerka*): fowl, *Cariwina*. Their pronouns are very simple. Personal pronouns among the Macusis are: *hure* (the h is silent) I: *hamore*, thou: *missére*, he: *hana*, we: *hanamore*, you: *incamore*, they. The Macusi for instance says: *hure Macusi*, I am a Macusi: *hure puriya puriwanna*, I am sick: *hure yenépé uyawanna*, I have tooth-ache: *hamore yenépé pupeiwanna*, thou hast headache. The brevity of language was specially noticeable when our interpreter expressed in twenty words at most what we had told him in often more than a hundred. The correct answer to our question on every occasion, or the accurate execution of our wishes showed that he had rendered an exhaustive translation of them.

597. Their letters are *a, b, c, e, g, h, i, k, m, n, o, p, r, s, t, u, w, y* amongst which it is only difficult to distinguish the *r* from *l*.

598. The nouns possess no declension by case as in Greek or Latin. The genitive has much similarity with the English and German, *e.g.*, my brother's house, *Moyeh yéwuh*, thy brother's house, *Hayakong yéwuh*, my mother's house, *Mamah yéwuh*. The dative is expressed by a prefix: I go to him, *Ipa* (to him) *ute* (I go), and also by a suffix; He goes to him, *Missere ute ipa*; He says to him, *missere ipa tapomong*. Accusative, I see him, *mokré yera moya*; I fear kanaima, *kanaima po sina napowai*. Ablative or case indicating locality. In the house, *auté tamang;* I come down from the mountain, *wui pai yepu-pure*. In connection with sex they distinguish between male and female by prefixing *worayo* (Man) or *whori* (Woman): *Waiking* is a deer, *worayo waiking* a buck, *whori waiking* a doe. A rooster is *worayo cariwina*, a hen *whori cariwina*. But there are some exceptions to this rule: *Arimaragha*, the dog, *Inapui* the bitch: to these exceptions especially belong certain words that relate to kindred.

599. Their adjectives, mostly derivatives from verbs, are really participles. Numerals in several of the tribes only reach to twenty, with fingers and toes for a basis, and commence with the fingers. All higher numbers are called "plenty" by them. Only a few tribes, particularly the Arawaks, count up to a hundred.

600. I am quoting here the numerals of the Macusi only:—

1	Tiwing
2	Sakené
3	Eserewa
4	Asakrepanna
5	Mia eteukeng
6	Tiwing mia pona timotei
7	Sakené „ „ „
8	Eserewa „ „ „
9	Asakrepanna „ „
10	Mia tamenaure
11	Tiwing pu pona timotei
12	Sakené pu pona timotei
13	Eserewa „ „ „
14	Asakrepanna
15	Pu eteukeng
16	Tiwing pu ratoi pona timotei
17	Sakené „ „ „ „
18	Eserewa „ „ „ „
19	Asakrepanna „ „ „
20	Pu tamenaura
21	Tiwing pemongkong (a person)

The explanation, like the inner working of methods of enumeration in general, is somewhat difficult and obscure. The fingers of the one hand are the real fundamental numbers; the basis of the whole system of counting is in units. *Pona* here means above, in addition to: *Mia* signifies the hand: *Eteukeng* (with the *Eu* very deeply sounded) is the one hand as a base number (the number 5); *Timotei* means to start, commence, *e.g.*, in reading a book, starting on the next page after the previous one has been completed. 5 is *Mia Eteukeng*: hand as base number. 6 is *Tiwing Mia pona timotei*: one (finger), hand (as representing 5), in addition to. 10 is hand twice, after which there are no longer any base numbers (representing 5's) for the feet (*Pu, Hupu*) now take on these functions and the fingers only act as substitutes for the units: the feet become the 10's, the fingers the 1's. The words which express the number 11 mean: one (finger, unity), feet (as representing the fundamental number 10), in addition to. The words which express the number 15 mean: feet and one hand. 16 is one (finger), other half (of the fundamental 10), in addition to, the *Ratoi* meaning the other half. 20 is feet twice. From 20 upwards this now becomes the basis of notation and is signified by the word *pemongkong* (an individual). 21 *Tiwing pemongkong* therefore denotes one (finger) and person (the fundamental for 20). The verbs are really conjugated and the nouns and pronouns are then incorporated with them.

601. I am also including a few remarks on their divisions of time. The interval from the beginning of one rainy season to the next, or from commencement of the one dry season to the next is a year; the Macusis call the rainy season *Timong*, and so *Tiwing timong* also *Tiwing Conno* (=rain) one year. *Awina* is the dry period of the year: *Tiwing awina* is one year. The year itself is divided into lunar months, which begin and end with the new moon. *Kapoi*, the moon: *Tiwing kapoi*, one month. *Kapoi-pacca*, the new moon: *imu pé kapoi wanne*, full moon. The day is called *Deké*: one day *Tiwing deké*. Each day is divided into different parts. At six o'clock in the morning they say *Erima-pui*. about sunrise; then comes nine o'clock "when the sun is high"; midday. *Nekata paira woe wanné*, "the sun straight over us": three o'clock in the afternoon, "the sun sinking"; six o'clock of an evening, *Wae hé wommé*, and the setting of the sun, *Ewarum pamu* also *Akomanune*.

Hanoina is midnight; *Erimapui winaki,* at sunrise; *Akapita crimapui,* the dawn. Intervals are expressed by pointing to a certain spot in the heavens and at the same time saying: "when the sun was there," "when the sun stands there," etc. The night is split into three parts. The first includes what we call evening: the second they distinguish by the words "when they all sleep"—this is the longest stage. The third is called the time of the cock-crow, at least this is what the Indian now calls the hours before sunrise, where fowls have become common. They have only a few special names among the heavenly bodies and constellations. The sun *Wac,* the moon *Kapoi,* the stars *Sirike,* the scorpion *Marite* (also the name of the insect), the seven stars (Pleiades) *Ta-mukang,* the Milky Way *Parana* (*Parana* also means the sea, and hence *Paranaghiri,* people who have come from over the sea), the evening star *Kai-wono* (wife of the moon, not only because Venus shines brightest amongst all other stars, and even throws a shadow, but because she is pretty well always to be found in his neighbourhood), and shooting stars *Wai-taima.* Sun, moon and stars are regarded as living creatures, and hence dew is *Siriké itaku,* the urine or spittle of a star. If they wish to describe the distance between one place and another, they express it by the number of nights they would have to stop on the way there. If the place is distant a five days journey, one says: "I shall sleep four times during the journey, and then arrive at the place." If the distance does not cover a complete day they express it in a peculiar way by the word *Hop-pah*: while pausing long on the first syllable they describe with the hand the course of the sun as far as the zenith, and then with the second *pah,* move the hand to the spot where the sun will be when one arrives there: and when the word is finally uttered in its entirety they strike their breast. Another peculiar custom among the Macusis is that so soon as the new moon is visible, all the men stand in front of the doors of their houses, and at short intervals stretch their arms forwards and backwards from it: they become invigorated for hunting by this means.

602. These are the scanty crumbs that I have been able to gather concerning the language of a few tribes in general: the vocabularies included in the appendix will at least somewhat complete the memoranda given.

603. It would seem convenient to add here certain remarks concerning the fabled viragoes, the Amazons, and the equally celebrated real Amazon stones, although what we have to say as the result of our own investigations is nothing new at all, it only consisting of a repetition of whole series of legends that have come down to us from classical times, and like the geographical situation of El Dorado have wandered through almost every clime. Alexander von Humboldt rightly says: "The myth belongs to one of those uniform and natural cycle of reveries and ideas with which in all ages the poetical and religious fancy of mankind is almost instinctively swayed. Christopher Columbus had hardly discovered the Lesser Antilles at the end of his first voyage than he imagined he was already in the neighbourhood of an island, Matinino (St. Lucia), which was only inhabited by women (Navarrete,

Vol. I. p. 134, 138) some of whom he would gladly have caught and taken with him to present to Queen Isabella."† All the more extraordinary therefore must be the recent publication in New York of a book under the name of "El Dorado" wherein a certain van Heuvel tries not only to retain the original size of the mythic Parima Lake, although he is very well acquainted with Alexander von Humboldt's works, but where, according to the attached maps, even at the present day, from out of the lake in question we have the Rio Branco streaming into the Takutu, Rio Negro, and Amazon stream, the Cuyuni pouring into the Siparuni, Mazaruni, and Essequibo, and finally the Paragua into the Orinoco. Van Heuvel was never in the interior of Guiana: all he did was only and solely to pick up hurriedly and greedily all the information he possibly could relative to the geographical relations of Guiana, El Dorado and the Amazon without submitting it to critical examination. He was anxious to preserve the historical truth of those poetical fancies and repeated, without bothering himself over it, what had been already published. Van Heuvel gives Lake Parima a length of 250 miles. Just as he still believes in this wonderful lake and all its mythical glory, so in his imagination, excited by the fantastic tales and legends alleged to have been received from Mahanarva, the last Cacique of the Caribs, he still harbours a republic of viragoes. According to what Mahanarva told him, these women occupy a spot on the river Wara which is entirely enclosed by mountains to which only one single entrance, a single opening, leads. In fact he also names from hearsay the tribe which the Amazons annually visit: they are the Teyrous or Tairas in Cayenne, of Carib stock. The river Ouassa is a branch of the Oyapok where Condamine says these "long-ear" Indians lived, as was stated to have been the case by Harcourt during his journey in the year 1608: its inhabitants are Caribs, of which long-eared nation some occupy the Marawini. We found the myths concerning the Amazons most widely distributed amongst the Macusis and Arawaks, and we had no reason whatever to grumble at any reticence, because information was very readily imparted to us by everybody, though in general it was but a repetition of what was already known. Every tribe transferred the locality to a different place which up till now had not been visited and accordingly remained unknown to it. An Arawak chief told me that his brother, who lived on the upper Mazaruni, had visited them on one occasion and had received from the Wirisamoca as he called the Amazons, one of their green stones as a present. They worked their fields without any male help, used the bow and blow-pipe and permitted men to visit them annually but once: his brother, however, had been charged by the Wirisamocas to invite his tribesmen to come and see them, but the number of visitors accompanying him must not exceed twenty. Male children were killed. The old chief had heard this from his own brother, but none of the Indians whom I interviewed concerning these fabled women had seen them themselves: this had always been the luck of their grandfather, father, or some relative or other who was not now alive or present. So again, at the sources of the Corentyne, where, on account of its being hitherto absolutely unknown, a last place of refuge had been found for them, my brother learnt nothing more definite nor did he discover the Amazons themselves.

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† Alex. von Humboldt: *Examen critique de l'histoire de la geographie*, etc., according to the translation, Vol. I, p. 275.

604. In my own opinion, the myth seems to have taken its rise in the warlike reputation of the women of certain tribes, particularly the Caribs. Columbus in his second voyage bears testimony to the courage of the womenfolk of Guadeloupe, by whom he was hindered getting ashore, while Peter Martyr d'Anghieri in speaking of these same islanders, says that both sexes possessed great strength and skill in the use of the bow and other weapons. "When the men are away from their homes, the women defend themselves against any sudden surprise attack just as valiantly as they do." The same was true of the Carib women on the mainland of whom Peter Martyr states: "In the sanguinary opposition shown to the Spaniards the women, after the death of their husbands, defended themselves with such daring and desperate courage that they were taken for Amazons." (Herrera Dec. 1.) (That the Carib women even nowadays accompany their men in battle and take an active part in the fight was practically proved in the Negro revolution of 1823.) Columbus had already on his first voyage found fighting women, and in them recognised Amazons. What the Old World had said about them he believed he was going to find in the New, but even after a search of 354 years the discovery has not yet been made.*

605. Extremely remarkable things at all events are the green Amazon-stones (Lapis nephriticus), the Piedras hijadas of the Spaniards, about which all Indian accounts agree that they come from the Amazons. Alexander von Humboldt found these stones among the Indians of the Rio Negro where they are carried on the neck as amulets for protection against fever, and the bites of poisonous snakes†: von Martius‡ saw them on the Rio Negro among the residents at Sylves, while I came across them in Georgetown.

606. It was through the Caribs along the Guiana coast that these stones were brought into Georgetown where they are known as *Macuaba* or *Calicot* stones.§ On the Orinoco they are called *Macagua,* apparently the same term as the former. Formerly the Caribs brought them to the capital in considerable quantities, but very rarely nowadays. I only once had the opportunity of seeing a specimen which was in the possession of a merchant there. It corresponded accurately enough not only in shape but also in colour with the description given by Alexander von Humboldt. From what the people told me, these stones were formerly often brought to town in the shape of fish and other animals, as well as with figures carved on their surfaces.

607. According to Barrere the Caribs treasured them more than gold: such a one was the price of a slave. Sir Walter Raleigh saw them

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*See Alex. v. Humboldt: Voyage aux régions équinoxiales, etc. Vol. VIII, Book VIII, Ch. XXIII, page 10, etc.

†See Voyage aux rég. Vol. VIII, Book VIII, Ch. XXIII and XXIV, p. 207.

‡See v. Martius: Reise in Brazilien, etc. Vol. III, pp. 1,087, 1,099.

§See Roth, *op. cit.*

on the Orinoco where he noticed every cacique with one which was usually worn by his women: they treasured them more than gold.* Lawrence Keymis says of the Caribs and other tribes who dwell on the Arawari, below the Oyapok: "Their money is white and green stones": he found the same thing on the Corentyn.

608. In connection with the place of origin of these Amazon stones accounts vary just as much as do those concerning the home of the Amazons themselves. Barrere was assured that the stones were found in the country of the Tapouyes, on the upper Amazon stream, who also shaped them. Chevalier Marchais likewise relates in his journey in Cayenne that the greatest riches of the Caribs consist of green-stone necklaces which they obtain from the upper Amazon stream, where they are made out of a tough mud into any shape required and hardened in the air. Charlevoix speaks of certain green stones with which the Haitians hollow out their canoes and remarks that they were never found on the island or its neighbourhood, but that according to common report they came from the upper Amazon stream, where they were made out of the river-mud. What Charlevoix probably referred to were those that we also frequently met amongst the Caribs and Macusis as stone-knives, axes, and in the war-clubs, which seem to belong to a serpentine kind of rock, but in no sense whatever were real Amazon stones. At St. Carlos, as in general on the Rio Negro, the sources of the Orinoco were pointed out to Alexander von Humboldt as the place of origin of these stones, though at the mission on the Caroni and at Angostura it was stated to be at the sources of the Caroni. A. von Humboldt further remarks that Spanish soldiers wanted to make out that they had found these stones in the rocky dam that crosses the Orinoco and forms the whirlpool of the Guaharibos, but as neither he, nor Surgeon Hortsmann who in 1739 went up the Essequibo to the Rio Branco,† nor Don Antonio Santos on his journey from Angostura to Grand Para in 1775, came across them, he considers the alleged place of derivation to be also a myth. My brother learnt just as little about them in these localities which he visited in the course of his expedition in 1837. According to Clavigero, the green stones found among the Guiana Indians exactly correspond with those which the monk Bernhard de Sahagun discovered among the Anahuacs at the conquest of Mexico. The Mexicans called the stones Quetzalitzli: according to von Martius, Xouxouque tecpatl. They cut all kinds of artistic figures out of the stone, because they understood not only stone-cutting and stone-setting, but even the cutting of diamonds. Judging from the numerous Mexican nephrites that one finds in different collections, they are absolutely identical with the Amazon stones, still procurable here and there in Guiana. Although up to the present no traveller or ethnologist has succeeded in showing a connection between the Mexicans and the Guianese like that which, according to Garcillaso, exists between the former and the people of Peru

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* See Cayley's Life of Raleigh Vol. II p. 360.

† A reference to this journey is to be found in "A Succinct abridgment of a Voyage made within the Inland Parts of South America: from the coasts of the South Sea to the Coasts of Brazil and Guiana, down the River of Amazons": by Mons. de la Condamine, London, 1747—J.R.

and New Granada into which they wandered, according to Herrera, by means of the Isthmus of Darien, it is not such an extravagant hypothesis to assume that in the course of that migration a branch turned off and settled in Guiana—when the stones could also have been introduced.† The very numerous hieroglyphics and picture-writings found by us on the rocks of the larger streams and upon the high mountain ranges might make the derivation of the Guianese from the highly civilised Anahuacs still more probable, in spite of the fact that this earlier stage of culture is, even in tradition, foreign and unknown to the present inhabitants.

609. It was because the myths relative to both Amazons and Amazon-stones have been many a time investigated by the most celebrated men of the present and past, without satisfactory results, that I considered it my duty not to withhold what I had learnt about them from the Indians during the course of my travels.

610. Before resuming the account of my experiences at Pirara I am anxious to add a few notes concerning the diseases especially indigenous to the Macusis as well as the treatment adopted, independently of the medicine-men's exorcisms. With this object in view, I propose including at the same time an inventory of all the plants which from a medicinal point of view are utilised for various complaints not only by Indians but also by coloured people and Negroes.

611. With the exception of the endemic skin-diseases already mentioned that seem to be the inherited lot of all the South American tribes, I found among the Macusis a predominance only of fever, dysentery, diarrhoea, dropsy, and inflammations of the abdominal organs, chiefly liver complaints, and amongst children, worm-diseases. The very large number of Indians with a monstrous swelling of the abdomen, which even amongst the youngsters is not unusual, shows how prevalent liver-affections must be. I will first of all mention the measures commonly employed in almost all cases of disease. If the Indian feels unwell, he takes to his hammock, has a small fire lighted under it, and rests himself for a few days. If the symptoms increase, he has the piai-man sent for who now practises his art, and then follows the ordinary routine. Steam baths and cold river-bathing occupy the chief place. No matter the nature of the complaint, the bath as I have already said, comes first. In the height of fever and with no strength left to take him to the river, the patient will be just as soon drenched with cold water as enveloped in steam: the latter is produced by quartz or pebble-stones made glowing hot, placed under the hammock and water then poured over them. Next to these universally adopted remedies comes bleeding which will also be employed in almost all diseases showing increased temperature even in every insignificant trouble, rheumatism, etc. One or more incisions are usually made into the nearest lying vein, or long vertical slits in the skin just where they feel the pain, either with a sharp piece of bone, the barb of a sting-ray, or with a knife: after the wounds have bled long enough the astringent and

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† Independently of such a migration it is quite intelligible that the stones came here in the ordinary course of trade and barter. (Ed).

caustic juice of the fruit of a *Passiflora* is rubbed into them.* I have seen no aborigines, be it an aged man or woman, a boy or a girl, who did not carry the scars of such barbarous bleedings. The third general remedy is a strict fast during which the sick person touches nothing but a boiled drink made of cassava flour. However unfortunate they may be in the cure of internal diseases, they prove themselves all the more successful in the simple and satisfactory treatment of wounds. Smaller wounds are washed out clean, then held for a time over the fire, and now bandaged. With bigger injuries or mutilations, the wounded person is laid upon a framework over a fire, the wounds carefully cleaned, and healing proceeds rapidly. I have already mentioned on several occasions that even the most horrible agony cannot force a murmur from their lips.

612. The plant remedies used by Indians, as well as by coloured people and Negroes are:

For fever:—

An infusion of the bark of *Eryngium foetidum* Linn., *Byrsonima crassifolia,* a decoction of the bark and blossoms of *Diospyros Paralea* Steud., *Scoparia dulcis* Linn., *Lisyanthus purpurascens* Aubl., *Myrmecia scandens* Willd., *Strychnos pseudo-quina* St. Hil., *Quassia amara, Uvaria febrifuga* Humb., Bonp., and *Nectandra Rodiei* Schomb. The last remedy is undoubtedly the most efficacious. The effects of a decoction of the bark or fruit of this tree—which at the same time supplies the best timber that is exported to England—have been known for some time. Dr. Rodie who owns a wood-cutting establishment in Demerara, and resided there a good deal, noticed that both the Indians and the Negroes when attacked with fever would put the bark, fruits, even the squashed wood, in a quantity of water, and then drink it especially of a morning when the fever would soon leave them.† He accordingly attempted to separate the alkaloid, which he succeeded in doing in one attempt, but never again. Bancroft had described the tree in 1779 in his "Natural History of Guiana" under the name of greenheart, by which it is generally known in the Colony. Botanically it remained unknown until shortly before our departure when my brother first obtained the blossoms, and the tree turned out to be a *Nectandra* to which he gave the specific name *Rodiei* after the European discoverer of its febrifuge properties. Almost all the coastal rivers, particularly the Demerara, possess the tree in large numbers, and should Peru limit the export of the real cinchona, greenheart bark will amply replace it. For intermittent fever, the Negroes particularly employ the roasted root of the *Maranta arundinacea* Linn.

613. Purgatives and Emetics:—

A small dose of *Jonidium Itoubou* is very effective as a purgative: a dram is sufficient to act as an emetic. The Brazilians use the root as a cure for dysentery. A dose of 6 to 8 grains of the resinous sap of

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* The "monstrous swelling of the abdomen" is probably not an indication of the prevalence of "liver affections" but due to enlargement of the spleen from Chronic Malaria. It is interesting to find the steam-bath, the cold-bath and the practice of bleeding so prevalent. (F.G.R.)

† At the present time it would seem to be most commonly used as a cure for diarrhoea, etc. (Ed.)

Vismia sessilifolia Pers. also acts as a purge. The sap from the bark of *Guarea Aubletii* Juss. and *G. trichilioides* Linn. serves at the same time both as a powerful purge and emetic. The seeds of *Hura crepitans* also act as purgatives but have to be employed with the greatest caution, because their effects are almost too drastic. The roots of *Cephaëlis Ipecachuanha* Rich. supply the strongest ipecachuanha. Remaining purgatives are *Adenoropium gossypifolium* Pohl., *Lisyanthus alatus* Aubl., *Boerhavia hirsuta* Linn., *Allamanda Aubletii* Pohl., and *Ascelpias curassavica*.

614. Remedies for Diarrhoea and Dysentery:—

An infusion of the bark of *Byrsonima crassifolia, Willoughbeia acida* Willd., *Stachytarpheta jamaicensis* and *Acrodiclidium Camara* Schomb. The properties of the last mentioned have already been described by Bancroft and Hartsinck, who speak of it under the name of "Akawai-nutmeg" by which the fruit is known in every family dispensary, while the late Dr. Hancock regarded its infusion as the most efficacious remedy for diarrhoea, dysentery, and colic. The tree had not hitherto been scientifically described: my brother recognised from the blossoms that it was a new species of *Acrodiclidium* and gave it its Indian name *Camara*. Its habitat would appear to be limited to the area between the 5th and 6th latitude N., particularly to the sandstone ranges of Roraima, because we found the tree hardly anywhere else.

615. For sudorifics a decoction of the bark of *Erythrina inermis* Burm., and *Swartzia tomentosa* is employed.

616. Acting as astringents are *Psidium aromaticum* Aubl., *Inga Burgoni* DeC., *Machaerium ferrugineum,* the fruits of *Anacardium Rhinocarpus* DeC., *Psychotria glabrata* Sw., and *Virecta pratensis* Vahl.

617. For syphilitic diseases which, though present among the Europeans and the tribes in continuous touch with them, are prevalent amongst the coloured people and especially among the negroes, but do not however assume the awful character that they do in Europe, the people use a decoction of the leaves of *Tetracera Tigarea* DeC., *Guilandina Bonduc* Linn., different species of *Spermacoce, Potalia amara* Aubl.* The sap and a decoction from the twigs of *Costos spicatus* Sw., act as an anti-syphilitic, as also do *Phytolacca decandra, Helioteres Sarcarolha* Juss., Waltheria Douradinha St. Hil., *Mikania Guaco.*

618. For syphilitic blenorrhoea no use is made of the *Balsam Copaiva,* a remedy entirely unknown to the negroes and coloured people, recourse being had to *Phyllanthus lathyroides* Humb. Bonp. and *Euphorbia hypericifolia* Linn. The most effective cure however is a second *Euphorbia* which on closer examination I found to be new, and growing in all the sugar-cane fields, the *Euphorbia erythrocarpa* Klotzsch. Whether it is that syphilitic blenorrhoea does not assume the same virulent character in these warm climates as it does in colder ones, or whether this *Euphorbia* is a real specific—its quick and radical

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* A strong dose of this is employed by the Indians as a powerful antidote against poisoning from the juice of the bitter cassava (*Manihot utilissima*).

effect is at all events astonishing.* The patient drinks one to two cups of a decoction of this plant every morning, and in from 4 to 6 days he is completely cured. During treatment, the negroes and coloured folk do not once abstain from rum or brandy. I brought away a fair quantity of the plant, to have some experiments made with it, but unfortunately the packet was spoilt by water getting in it.

619. For frequency of micturition and other diseases of the bladder one generally employs a decoction of the bark of *Rhizophora gymnorrhiza* Linn., of *Phyllanthus Urinaria* Linn., of *Abuta rufescens* Aubl., *Ruellia tuberosa,* different species of *Smilax, Remirea maritima.*

620. Remedies for ulcers and skin eruptions:—sap of the *Myristica sebifera* Sw., decoction of the bark of *Anona Ambotay* Aubl., of *Miconia alata* DeC., *Vismia sessilifolia* Pers., *Virecta pratensis* Vahl., *Heliotropium scorpioides* Humb. Bonp., *Omphalea diandra.* They make a decoction out of the last one for cleaning wounds.

621. As vermifuge the Indians likewise make use of *Chenopodium ambrosioides* Linn.

622. These are only some of the most commonly used and effective remedies, but how many medicinal treasures may not the forests contain, the healing powers of which are known neither to the colonists nor to the Indians, so that like buried wealth they bring advantage to no one. What an infinitely rich field for research awaits the physician alone in the innumerable species of *Euphorbiaceae,* from the highest tree down to the lowliest plant, of which certainly none is without medicinal properties. The *Laurineae* family are of equal importance not only on account of their aromatic qualities, but also in consequence of the volatile oil which is used by the Indians for rheumatic troubles as an external application, as well as for diuretic and sudorific purposes. Among *Cinchoneae* are still to be found a number of new species because, as already mentioned, I discovered two species, *Ladenbergia Roraimae* Klotzsch, and *Ladenbergia Schomburgkii* Klotzsch, in the neighbourhood of Roraima alone, at 4,000 feet above sea-level, but their properties were entirely unknown to the aborigines. On the other hand they know the diuretic and mollifying effects of *Smilax,* of which Guiana possesses several species, although *Smilax sarsaparilla* and *S. syphilitica* are not forthcoming. Amongst *Caesalpineae* I would direct attention to several species of *Copaifera* and to *Hymenaea Courbaril,* among *Amyrideae* to *Amyris Carana* Humb., which supplies a substance that resembles Gum Elemi, to *Amyris heterophylla* Willd. that yields the Acouchi Balsam, and to

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* The reference is to Gonorrhea, which he confuses with Syphilis. It is certainly not the case at the present day that it does not here "assume the same virulent character" as in cold climates. Its well-known sequelae are as frequent and as far-reaching as elsewhere. I have no knowledge of the use of Euphorbia erythrocarpa, Klotzsch. In these days the prevailing fashions of vaccines and sera and electrical treatment have led to some neglect of the study of pharmacy. Much of the old lore has been forgotten, and the empiricism of the old methods has cast perhaps undue discredit upon them, but it would seem that a scientific study of the modes of action of these substances in which these forests so abound would be of considerable value and would mean a valuable addition to the armamentarium of the medical practitioner, when the wind veers round again. (F.G.R.)

Amyris ambrosiaca Linn. the fragrant Conima resin. Among *Humiriaceae, Humirium* (*Myriodendron*) *floribundum* is known for its Umiri balsam. Various species of *Clusia* also supply resins: among *Hypericeae, Vismia guianensis* Pers. furnishes Gumi guttae. Among *Sophoreae* we found in 2° 32′ lat. N. an entire forest of *Myroxylon toluifera* Humb. Bonp: the natives had threaded the sweet-scented seeds into necklaces.

623. Of trees possessing vegetable oils, I need mention but the *Carapa guianensis* Aubl., *Lecythis Zabucayo* Aubl. and *Catinga moschata* Aubl. The oil from the seed-capsules of the last mentioned has an uncommonly strong musk scent. The seeds of the *Myristica sebifera* when thrown in boiling water give a vegetable tallow which is used in the colony for lighting purposes. I am omitting the dye-woods and tanning materials of Guiana because an account of them would take too long.

624. With Lent and hopes of better times the end of March came round and we daily expected to receive news of my brother having reached Wai-ipukari Inlet. We already thought our expectations fulfilled on seeing some Indians in cotton shirts coming from that direction to Pirara. We joyfully hastened to meet them only to learn that a coloured man, Levingston [?Livingstone] had arrived at the Inlet with two large craft not only to barter with the Brazilians on the Rio Branco but also with the Indians from Pirara, amongst whom he still expected to find a considerable portion of the cash that had been brought here by the military. The speculation was keen and daring, and astonished us. In his letter, which the bucks brought us, Livingstone asked us to send him a horse, as he was naturally lame and could not cover the distance on foot. The enterprising trader arrived some days later with his Indians and coloured folk, his boxes and cases: he also brought news from my brother who would be following him in a few days, as well as a number of letters from home.

625. Levingston was not a little surprised to find Pirara an empty Indian village instead of a populous and thriving one, and his keenly constructed castles in the air commenced to fall: as a matter of fact, within a few days he knew for certain that his speculation was doomed to failure.

626. Even when his presence again enticed a number of Indians to Pirara, there was only but a little cash offering for his magnificent wares, and so as not to have to return to Georgetown with what he had brought up, he was forced to do business in hammocks, cotton, letter-wood, sweet-scented resins, dogs, parrots, etc. His other idea of going to the Rio Branco with his "trade" was also knocked on the head because he had no pass from the President at Para, without which the commandant at Fort Sao Joaquim did not dare let anyone proceed. Though Captain Leal and Friar José already appeared at Pirara some days later as buyers, our warnings had nevertheless made Levingston so suspicious that without further guarantee he declined the proposal of both gentlemen to let them buy the whole lot, in return for which they would then forward him considerable quantities of sarsaparilla, copaiva, balsam, tapioca, etc. He escaped this trap however only to fall into

another, because soon after our departure he got into the clutches of Matoz, the Boundary Commissioner, who bought everything he possessed and promised, as soon as he got back to Para, to send him a draft on the Colonial Bank in Georgetown. This order, however, had not arrived up to the time of my departure for Europe, just like the seven baskets of farinha for which Captain Leal was still indebted to us.

627. Moore, who until now had been cook, seized the opportunity offered by the return of the one corial to hasten back to his beloved coast with all its rest and repose. His contract had expired, but he had long ago had enough of the hardships, troubles and sufferings, and the 225 dollars which he had earned in the 15 months, appeared to him an ample sum upon which he could henceforth lead a leisurely life. Tiedge was now the only one left and he also did not wish to accompany us farther: after my brother's arrival he wanted to visit Georgetown where he was anxious to earn still more with what he had already saved. They left us convinced that they were going to be rich people, only to meet me on my return to Georgetown with the shame-faced avowal that they were again just as poor as before. German had cheated German of his bitterly earned wages, while coloured people had wasted that of their own colour. Moore alone had made honest use of his by buying a piece of land on the Demerara, that supported him comfortably. A few days after the latter's departure two of my brother's boathands whom he had despatched ahead in a light corial from Haiowa, brought us the news that he had arrived: we hastily left for Wai-ipukari Inlet to give him a welcome. On 24th March he landed with his three large corials and his Arekunas, weakened with dysentery, who had accompanied him from Roraima. The greater part of the baggage was stored in the house of an Indian of our acquaintance who had settled here, and only what was most absolutely necessary taken to Pirara, so that a commencement might be made with the survey of the eastern boundary as soon as possible. Tiedge also returned to Georgetown with the coloured men who had engaged with my brother as captains.

628. Sufficiently convinced from our travels on the Cotinga that the Indians were far from knowing how to handle big craft too well and that the savannah folk were in no sense such good boathands as the coastal tribes it was proposed that those returning home should show up again at Pirara at the beginning of June. My brother had received instructions in Georgetown to map out now the eastern border of British Guiana, i.e., the one facing Surinam. The Corentyn had already been stipulated as the boundary, but the upper portions of this river and its source were still absolutely unknown. Mr. Fryer and I were anxious to accompany the expedition as far as the spot where the laborious journey over the mountains commenced, and then return to Pirara and fetch the collections left behind, collections which, in view of past experiences, I would never again trust to strange hands at any price. To transport them however over the range, together with the luggage and the provisions for the expedition, required at least 60 to 80 Indians, but whether we should find so great a number certainly remained very doubtful.

629. The first few days at Pirara naturally passed very quickly in telling one another what we had been doing since we parted. As already mentioned my brother had left Our Village on the morning of 5th December. The path led straightway up-hill where those conglomerate masses of ferruginous clay, with which the savannahs of the Takutu and Rupununi are covered, were everywhere met with. In the afternoon they again went down-hill and soon crossed the track along which my brother had reached Roraima in 1838. The small settlement Waramatipu in which he had stayed on that occasion had disappeared: some spots of low brush-wood alone showed that houses had once upon a time stood here, nothing else being left to indicate the pleasant little village of those days. Towards evening and tired they reached Canaupang, the village of our friend Kaikurang, where some of the residents, on seeing that their chief was accompanying my brother, expressed their readiness to come also: he had accordingly to remain a couple of days there to allow them time for collecting provisions. In the course of his short strolls he found on the banks of the Mapauri a little forest formed entirely of the "Akawai-nutmeg" or Camara, and as they were in flower he was able to determine the tree as *Acrodiclidium Camara.*

630. On December 8th my brother left Canaupang village, climbed the mountain which had given the name to it, and on the summit, in the hope of getting hold of some skeletons turned with Sororeng along a side-path in the neighbourhood of Arawayam village, where the oft-time mentioned feud had broken out, and the victims of which ought still to be lying unburied on the field of battle. Unfortunately he came a few days too late because, judging from several indications, the relatives of those fallen had only just left the scene of strife with the collected bones for their present settlement. In the afternoon they reached the Yuruani which already had a breadth of 500 feet, although its source of origin could hardly be 10 miles behind them: its depth varied between 6 and 13 feet. The first thing they managed to do next morning was to take the luggage over in a small "wood-skin" which they fortunately found there. The road again led up-hill over terrace-like sandstone steps dotted with numerous rounded-off quartz-fragments. Owing to the wash of the rain-showers pouring down over the horizontal strata, the latter had developed quite a columnar structure in certain places. A deep land-slip had taken on a very interesting and curious appearance through two columnar hardened masses of clay which rose from the bottom of the cauldron-like excavation to a height of 20 feet.

631. Travelling in a south-westerly direction the party reached towards two o'clock the junction of the Kukenam and Yuruani from which spot both streams now receive the name Caroni that falls into the Orinoco below Angostura. From the hill on which they stood the whole Roraima range from Carauringtipu to the eastern end of the mountain could be seen: They spent the night on a swampy mountain savannah. The luxuriant vegetation consisted chiefly of *Melanthaceae, Erocauloneae, Xyrideae,* and *Commelynaceae.* Many of these plants were quite new to my brother: among such were two *Rapateae,*

the *Rapatea Friderici Augusti* and the new species *Saxo-Fridericia Regalis* with its glossy leaves and beautiful yellow blossoms.* After being startled during the night with an awful storm they continued their journey in the morning, and at the end of a 4-mile stretch, found themselves on top of the range, from which all the waters flowed northerly to the Apauwanga, a tributary of the Caroni: the former appeared to have a S.S.W. course. The slope of the mountain declined towards the N. and at 11 o'clock they stood on an abrupt precipice at the bottom of which the Cama meandered its way. In the neighbourhood of the steep descent my brother finally discovered in bloom one of those plants that had already aroused his interest in 1838 and which on the Humirida had stimulated it in us anew: it was a new *Barbacenia* which, in honour of the Empress of Russia, he called *Barbacenia Alexandrinae.** While the Indians who now saw the valley and the new watershed for the first time, (so as to propitiate Barang, the mighty spirit,) rubbed their eyes with powdered cayenne pepper, Kaikurang, who did not need to practise these devotions, served my brother as an excellent guide in this lovely area. The mountain chain which he still had to cross on his journey to the Cuyuni stretched away into the blue distance: the savannahs, furrowed with streams, spread themselves out between it and his standpoint: in N. by E. a second range of mountains, along which the Mazaruni should be flowing, ran from E.SE. to W.N.W. Judging from its contour it must rise just as steeply as Roraima, a fact which my brother confirmed with his telescope as soon as the sun could forge a way through the broken clouds and shine upon its sides. From the red colouration of the abrupt slopes, the mountain chain belongs to the same formation as Roraima. My brother thought that he recognised in the former the mountains which Mr. Hillhouse on his journey up the Mazaruni called St. George and took to be quartz rocks although they are sandstone beyond a doubt. The Cama, which has its source on the Irutipu, flowed along their base into the Apauwanga. On the North the Irutipu has quite the appearance of an immense obelisk. Somewhat to the East of the Cama, on the northern side of Irutipu, the river Cuyara runs along to join the western Cako which flows into the Mazaruni. The Cako takes its rise in the peculiar base of that remarkable mountain which the Indians call Waiaka-piapa, i.e., felled waiaka tree.† In the afternoon they reached two houses on the bank of the Cama, in about 5° 12′ lat. N., where they spent the night, but the clouded skies did not permit of any astronomical observations. The thermometer had until now usually recorded a temperature of 67½° F. at 6 a.m., 79½°F. at noon, and 68½°F. in the evening, which gave an average of 72.7°F.

632. As my brother, in addition to his objective already mentioned, was anxious to learn the extent of the basin of the Mazaruni, he now turned to the west to visit the sources of the Carimang or Carimani, a south-westerly tributary of the Mazaruni. On the 12th December, after crossing a little forest, they unexpectedly stood at the beautiful Cama

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* The foot-notes giving the technical descriptions of these plants, in Latin, are omitted. Ed.)

† The 1913 official map of British Guiana does not show this. (Ed.)

waterfall, the dull thunder of which they had already heard during the course of the night. Below them the stream shot down to a depth of 130 feet. They next ascended a neighbouring height on the top of which they again followed terrace-like declivities for some miles, crossed a considerable-sized stream, and then climbed a second mountain-ridge, the dividing range of the Mazaruni, which stretches away from Irutipu in an entirely westerly direction. The Annawai was the first stream of importance that they met after entering the watershed of the Mazaruni. It flowed from the East to the Carimang, close to the source of which, after an exhaustive march of 18 miles, they reached a small village.

633. Although the Akawais are generally known as the tribe most fond of travel, my brother was nevertheless surprised to find a settlement of them so far westwards among the Arekunas. The little village numbered 22 occupants.

634. The source of the Carimang lay somewhat N.W. from the little village on the slope of a wooded range of hills on the opposite side of which the rivulets streamed into the Apauwanga.

635. During the next 24 hours the way led over swampy savannahs, and the provisions were at so low an ebb that the 14th December was almost hailed a fast day. They now turned from W to E. At last, after many difficulties they succeeded in crossing the Cutzi, a swishing mountain-torrent 110 feet broad. Some of the Indians, who on account of the depth had to carry their loads on their heads, were even carried along by the current whereby luggage got lost. The rain fell in torrents. On the opposite bank they had again to climb mountains from 12 to 1,500 feet high.

636. In the afternoon they reached an Arekuna settlement still in the course of construction. The large house, which was surrounded by several smaller temporary ones, had not yet been completed: for protection against night-surprises and jaguars the whole of the buildings were surrounded with palisades. As the male occupants had all marched off to a drinking party, from which they were not expected for another three days, one of the women ventured on the road to inform them of the presence of the strangers: in the absence of their men they did not dare sell any extra large quantity of provisions, and they themselves could only be tempted by the seductive sight of some glass necklaces to give them just as much as would relieve their ravenous hunger.

637. The Carimang which irrigates the foot of the hill on which the settlement lay had a breadth of 60 feet here. A mile from the village it formed a big cataract, the wild roar of which could be distinctly recognized in spite of the pouring rain.

638. The sister of the chief, a slim young buckeen, a widow, carried on the chief command during her brother's absence. Her husband had fallen in the feud mentioned and her whole love was now centred upon her child, a pretty boy. The woman whom they had despatched returned next morning with the news that she had found the men in a deep state of intoxication, but as the drink was running short, they would soon be following her. In the evening my brother heard the beating of the drum

with the sound of the fife, and soon saw five men coming along, but who in consequence of the bacchanalian feast were still so overcome as to render it impossible to have a sensible talk with them. It was only on the next morning that this was possible. As Kaikurang wanted to return from here to Canaupang, he handed the party over to the chief of Carimang, who was to take them to the first Akawai settlement. The village lay in 5° 44′ lat. N. The difference between the dry and wet bulb thermometer seldom measured more than 2 degrees, its highest position 81°, its lowest 66.2° F.: the height was 1,830 feet above sea level.

639. On the morning of 19th December the party left the little village and followed for a time the bank of the Carimang. After a two-hours' march they reached the isolated crag Kapoi-tipu, i.e., moon-rock, which rises to about 400 ft. and has received its name from a yellow semilunar-shaped mass of quartz embedded in the sandstone.

640. In Carimang they brought my brother fruits of the *Musa paradisiaca* and *M. sapientum* which must be growing wild in the neighbourhood. Near Kapoi-tipu he also found the former flourishing among *Heliconia* and *Ravenala* whence they stretched for more than half a day's journey along the bank of the little stream Paruima. The soil consisted of a yellow ferruginous clay mixed with sand and quartz fragments. Some of the plants reached a height of 50 feet and their stems a thickness of 4 ft. with the result that they formed so thick a fence that the party had to cut a way through. My brother found no seed-grains in the fruits the shape of which at the same time also differed essentially from those of the cultivated plant, in that not only were they considerably larger but not so sharply triangular. "It was not men, but Makunaima when he yet lived on earth, who brought the plants here." However much the statement that the *Musa* is not alone peculiar to the tropics of the old world but also to those of the new may militate against all past experience, the occurrence of so luxuriant a growth over an area of more than 50 square miles is nevertheless very remarkable: the absence of seed-grain in the fruits of course conflicts with the assumption that it is indigenous. The Indians had also shewn us previously several places where they were growing wild, *e.g.*, Mt. Vivi on the Rupununi.

641. They pitched their camp at the foot of Mt. Warima-tipu, a sandstone cliff similar to Kapoi-tipu, except that on one side it could be climbed. From the top, almost overgrown with *Sobraliae*, they saw the huge obelisk-like Irutipu in S. by E. The *Sobralia Elisabethae* had individual stems 18 ft. high, while a *Maxillaria* with reddish brown blossoms occupied whole tracts exclusively. Except for a *Papilionacea*, the only arboreal form present, the surface was otherwise covered with orchids, a bush-like *Clusia* and several equally bushy species of *Andromeda*.

642. After following the Paruima (a tributary of the Carimang) for some time, they crossed it in a woodskin and on the opposite shore commenced to climb up-hill again. Upon the top, my brother noticed towards the west a steep, about 2,000 ft. high, mountain chain which the Indians called Kauru-tipu (Cauratipu). It also seemed to belong to the sandstone formation.

643. On the 21st December they stepped on the watershed of the Cuyuni. The Cori was the first river to turn northwards to the Wenamu. They found themselves some 2,700 ft. above sea-level. The dividing water-shed did not run along the highest ridges, but more along the northern slopes while the tributaries of the Mazaruni which have their origin on the same northern declivity at first turn easterly and only later bend in a southerly direction, to hurry on their way to the Paruima.

644. On the morning of 22nd December, the way led once more uphill. The broad mountain-ridge was covered with low brush-wood, moss, and white lichen (*Cladonia rangiferina*). *Arum* and other genera belonging to the *Aroideae* and ferns, especially *Polypodiaceae* formed the chief vegetation. Amongst the orchids that flourished in amongst them my brother was particularly struck by an unknown specimen with huge flower-stalks that bore at least 40 to 50 blossoms. The beautiful *Mauritia aculeata* also appeared to be thriving well at this height of more than 3,000 feet above the sea.

645. The higher they climbed, the rockier became the slopes and scantier the vegetation, which on the massive sandstone plateaux assumed an almost alpine appearance. A number of rounded-off pieces of quartz were imbedded in the sandstone: my brother also found several six-sided crystals. As they reached the highest ridge between huge blocks of sandstone, the chief, beckoning my brother to follow, led him to a giant crag, with a sort of platform on its top, up which they scrambled, followed by all the Indians, whence they saw one of the most magnificent panoramas spread out below: even their companions, who for the first time trod upon this spot, gave way to a loud cry of astonishment. Steep mountains, among which Pakarampo was especially prominent, rose towards the North with the Wenamu meandering along its base until received by the Cuyuni, a certain precipitous cliff being pointed out to him as the situation of its mouth. The range upon which they stood stretched along to the West, while to the Southward they took in at a glance the steep mountain-massif they had already noticed the day before, and which the Indians called Kauru-tipu, while far far away in the distance they could see Mt. Irutipu enveloped in dense masses of cloud. The high mountains of the Mazaruni limited the horizon to the Eastward, while at their feet there yawned an abrupt abyss on the farther side of which there waved an ocean of green, the tops of densely growing trees, down upon which they gazed. In the meanwhile a strange sight was developing itself around my brother on this platform of Cara-utta. The Indians who had never visited the spot before gave themselves up to the wildest orgies. Several calabashes with paiwari stood upon the rocks in front of which two old Arekunas squatted with faces turned to the North, at the same time mumbling unintelligible words while the equally old medicine-man rubbed powdered capsicum into the eyes of each of the novices. As soon as the first pains were over, they brought some twigs from the nearest scrub and lashed one another on the legs and feet until the blood flowed. The yelling of the children, the growling of the men, whose rage for

whipping was ever increasing, and the loud droning of the two hoary old men which was intended to propitiate the Evil Spirit, coupled with the high state of excitement of forty Indians on an area of hardly sixty square feet, and close to that precipice at least 400 ft. deep—together constituted a spectacle that even made my brother feel anxious, with the result that he left the rock and waited for his companions on the main track, where they arrived at last, exhausted, and threw themselves down near their loads which they had left behind.

646. In the afternoon, the way was suddenly blocked by a deep terrace-like canyon. Just as we had to climb the steep walls of the Humirida, so had the party to clamber down these sandstone terraces to which a rough kind of ladder had been attached. It was only by this means that communication between the Indians on this and the other side of the chasm was rendered possible: to climb these individual terraces without ladders would have proved just as impossible as to reach the plateau of Roraima without wings. Not knowing how long it was since the ladders had been last used, the most daring of the Indians undertook to convince himself of their safety and for this purpose fastened up with vine-rope every rung that he did not think strong enough. After some hours when the last one had safely gained comparatively level ground, the first to arrive had already pitched camp.

647. On the morning of 23rd December they reached an Arekuna settlement. About three miles east of the village there stretched from N.W. to S.E. a mountain-bluff which the Indians called Arwarimatta; it happened to be a favourite breeding-ground of the *Rupicola aurantia*. The lovely note of the Flageolet bird, as the Colonists call it, was also heard there every morning.

648. Christmas Day, they struck the junction of the Carapu with the Wenamu: the former flows into the Wenamu in a direction contrary to its current. Once on the opposite bank of the Carapu which they reached with the aid of a frail canoe, they had to cut a path with cutlass and axe. Towards evening they reached a settlement surrounded with palisades, but where they found but one woman and her child, hunger having driven the remaining residents to other settlements. Mt. Kinauriké raised its head twenty miles off in S. by E.

649. The morning of 26th December brought the party to the opposite side of the 250 ft. wide Wenamu. In the N.E. lay the sandstone wall of Poinka-watu (*i.e.*, Pekari-snout). Rapids now succeeded cataracts, and cataracts rapids, so that the whole surface of the river formed a rousing mass of wave. In a north-by-westerly direction they crossed the 1,500 ft. high mountain chain that reached to the river bank, and next morning arrived at Immapara waterfall. Here they tarried a few days to complete the wood-skins required for their river-journey. Owing to the almost uninterrupted rain-showers the Wenamu was nearly flooded. During the period from 4 o'clock afternoon of the 28th, until morning of the 29th, the rain-fall amounted to 4.28 inches. They travelled fast along the sandstone cliffs, and along Mt. Pakarampo

which stretched from N. to S., and at the base of which the river Wenamu ran its course.

650. In the neighbourhood of Mt. Auran-tipu the dark-coloured Marawar joined the Wenamu. Somewhat distant from the place of junction was the settlement of Arikanang with 4 houses and 50 occupants: they were now in the country of the Akawai. The village was in 6° 26′ lat. N. and 61° 17′ long. W.

651. On 2nd January they set out on their journey down the Wenamu, the course of which was from South to North. The high but isolated sandstone mountains on the right or eastern bank of the river pursued a direction from W.N.W. to E.S.E. On the morning of 3rd January they had to pass several rapids. Owing to the carelessness of the captain the woodskin that carried the kitchen wares, salt, etc., struck on a rock and sank, and they hardly managed to save the people, especially Adams, the lanky cook who was more worried over his pouch, that contained some of his spare cash, than over his life. Until their return to Georgetown they therefore had to use calabashes instead of plates, and fingers instead of forks. There was no more salt now for the table.

652. Soon after midday, the junction of the Wenamu and Cuyuni was reached. They stayed at the neighbouring Akawai settlement until January 7th. The junction is in 6° 44′ lat. N. and 61° 15′ long. W. A few days' journey farther up, the Yuruari River joins the Cuyuni. By means of a short portage an active trade is found on it with the Indians of the Caroni.

653. The party now followed the course of the Cuyuni: the huge sandstone ranges ran nearly E. to S. As they only had woodskins the many rapids and cataracts made the journey unusually dangerous. In the evening they got to the Carib settlement which Mr. Hillhouse had visited coming up the stream. According to his distances, as he gives them in the London Geographical Society's journal, the village must lie far on the other side of the Caroni.

654. The following midday they came to the mouth of the Ekruyeku, which is about as wide as the Wenamu, and has the coffee-brown sediment of the Rio Negro. In the neighbourhood of the mouth rise the steeply precipitous much-notched and uneven walls of the Ekreku mountains which without doubt constitute the most northerly spur of the Roraima range. Towards evening they pitched their camp at the mouth of the Curuma which flows through the savannahs that reach here northerly from the Caroni, and where numerous herds of cattle are pastured. The Spanish post Cadiva was formerly established on the opposite side of the Curuma mouth. Mt. Maurucaru, also of sandstone formation, lay to the S.E. A mountain similar to Maurucaru the Indians called Yapong.

655. On the afternoon of the 10th January they had reached the mouth of the Acarabisi and found themselves once more on known channels. On the 17th they got to Cartabo Point and on the 18th to our mutual friend Bernau at Bartika Grove from where my brother returned to Pirara via Georgetown.

656. In spite of every effort to start on our new expedition as quickly as possible some eight weeks elapsed before this could be effected: the low water in the Rupununi, up which we intended travelling as far as we could, proved the chief cause for the delay. We had therefore to wait for the commencement of the rainy season. I utilised the interval in making many a botanical and zoological trip. That interesting method of taking fish in the now apparently dried-up swamps and lakes of the savannahs was again put into practice by whole caravans of Indians who almost daily made their way here: the bounteous harvests of these poisoning expeditions in the Pirara having to be smoked, the village resumed its normal activities for a short while, I at the same time getting hold of many an interesting specimen. Among the many laughable and serious scenes that were for the most part connected with the fishing here, there is one especially that my memory still retains. In company with a large party of Indians I also went off one day to one of those large swamps, several miles from Pirara, the surface of which was entirely covered with *Nymphaea.* The root of the *Lonchocarpus densiflorus* was actively beaten and washed out in the water, the effects of the poison soon becoming evident. Old and young, everybody was busy collecting the spoil and bringing it to the banks, when, suddenly, a boy who had approached a thick covering of *Nymphaea* gave a shriek, and the peculiar movement of the shallow water in his neighbourhood betrayed the presence of a kaiman. The attack made by the creature on the boy had fortunately failed: with open jaws and bent tail, both raised above the water, the brute now came swimming towards us. Everybody tried to land as quickly as possible but owing to the thick mud this was not at all easy to do. The resulting confusion must have been very laughable indeed to those who were not personally interested. Anyone encumbered with any weight threw it away: bows, arrows, and fish were discarded, the whole assemblage had but one goal, the land, which fortunately all of us reached: the monster had not followed us farther, but maintained its threatening position in the middle of the water. The hail of arrows directed at it from the water edge troubled it so little that it just remained where it was: no one having fire-arms the whole party was broken up, no one venturing to go back into the pool. When, next morning, armed with a gun and accompanied by some Indians, I strolled along the swamp, I came across several heaps of the shells of *Ampullaria guianensis* and *papyracea*, which were stacked either under one of the trees or at least close to a bush. From some of the shells the mollusc had been extracted only a short time before, but the large proportion on the other hand must have been exposed for years to the weather. From what the Indians said it was a black ibis of which they showed me several wading around in the swamp, that was the zealous collector. This peculiarity of eating its prey in a fixed spot I had never heard of before with any bird, and hence it was all the more regrettable that its caution and shyness frustrated all our efforts to obtain a specimen. I found eight such heaps, each of which was four feet high. Probably each bird had its own spot.

657. A few days prior to my departure from Pirara it was my lot to see a portion of it disappear in flames. We had just left our houses to go and fish in the lake when our attention was attracted by a broad belt of flame shooting out of the house occupied by the old woman who had proved so faithful to us. Everybody rushed to help, and the palm-thatch, parched to very tinder through the dry time of the year, caught alight with every falling spark. The house of our dead friend that Mr. Goodall had moved into, was the next to catch alight, and it was only with difficulty that we succeeded in saving the sketches and other things. The Catholic Church followed suit. To think of quenching it, was out of the question owing to the lack of water which would have had to be brought by Indians from the distant Pirara in calabashes, and we had only to thank the favourable wind that our own houses as well as the collections did not also fall a prey to the conflagration. A little boy who had been playing with a fire-stick in the building, where the conflagration started, had got too close to the inflammable thatch. It was only with the greatest effort and danger that my brother could rescue the old woman from the burning quarters out of which she wanted to fetch the property of her grandson who happened to be away hunting: this included several pounds of gunpowder, his earnings for the Roraima trip. We anxiously awaited the moment of explosion which fortunately wreaked no further damage on the neighbouring structures, as the building was already burnt down. During the night the first rains fell and extinguished the glowing embers.

CHAPTER X.

My Departure from Pirara—Experiences at Wai-ipukari Inlet—Remarks on the Kaiman—Start of the Expedition up the Rupununi—Mouth of Maurukiamu-Curua Settlement—Attalea speciosa—Aripai Settlement—Cassicus persicus and haemorrhus—Harpyia destructor—Burukutuau-yari Peak—Kuiaraton Settlement—Smallpox—Curuayari Falls—Ruru-ruru, Tremital and Trekutaratepau—Matziendaua Mts.—Mouth of Catuau-uru—Paruauku Portage—Fryer's Cataract—Cuta-tarua Fall, Corona of the Portuguese—Sarata Fall—Sources of the Rupununi—Landing-place of Watu-ticaba—Waruau—Watu-ticaba Settlement—Myroxylon Toluifera—The Last of the Amaripa Tribe—Extinction of the Atorais, Daurais, Tarumas—The Woyawai—Separation of the Expedition—My Return to Pirara—Colonel Matoz and his Determination of the Boundary Line—Departure from Pirara—Running down the Cataracts of the Essequibo—Waraputa—Mr. Pollert—Bartika Grove—The New Penal Settlement—Return to Georgetown.

658. News coming to hand that the Rupununi was beginning to rise, I left for Wai-ipukari Inlet in company with Mr. Goodall and several of the paddlers, to take delivery of the baggage and to see it packed in the corials that meanwhile had been once more repaired by Hendrick. We spent the interval in hunting kaiman which, as I have already said, resided in large numbers not only in the Inlet and in those spots where the current of the Rupununi is less rapid, but particularly in the Awaricuru, and were so given to plunder that, one night, they actually dragged into their own element a tame jabiru of mine that slept close to the water-side. In the same way, also at night, they seize dogs coming down to the banks to drink. The latter, however, are so well aware of the danger threatening them that as soon as they perceive the enemy lying in wait they commence barking loudly and continue at it until the kaiman leaves its lurking place. They are undoubtedly the most rapacious and voracious of animals: they even swallow the sticks and stones that in their greed they consider palatable: on dissection I found, even in the small kinds, heaps of such articles in their insides.

659. To see how the kaiman seizes its prey, I often tied birds or large fish on to a piece of wood and then let it float. The bait was hardly noticed by one of the animals before it would slowly swim up towards it without disturbing the surface of the water. As soon as it got fairly near, it bent its body sideways into a sort of half-circle and then with its tail—for it can curve its tail round to its snout—swung everything within this semi-circular space into its open jaws, which now closed: disappearing under the surface of the water with its victim, it put in an appearance a few minutes later close to the water edge, and would devour it here or on a sandbank. If not too big, it would only

rise up to its shoulders out of the water and swallow it in this position. Its usual food is fish, which it mostly kills with a blow of the tail and at the same time slings over the water to catch in its jaws.* The snapping of the snout and the lashing of the tail produce a loud noise which one can hear at a good distance particularly on a quiet night. I was surprised to find that the female cherishes the most devoted affection towards her young for a long period and that she continually watches, and defends them with the greatest courage—as I came to learn from an experience of my own. In company with an Indian I went one day along the lake-like bay of Awaricuru to shoot fish with bow and arrow. My attention being drawn to a peculiar cry very like that of young cats, I thought I was getting close to the lair of some tiger-cat when my companion, pointing to the water, shouted out "Young kaimans." The sounds proceeded from under the limb of a tree which, owing to the washing away of the earth around its roots, had bent over the water in a horizontal direction, until its branches were touching it. We carefully slid along the trunk as far as the top, when beneath me in the shade I saw a shoal of 1½ foot-long young brood. As we were only about three feet over the water, it was an easy matter for the Indian to shoot one of the baby animals with an arrow and to haul it struggling and squalling out of the water. At the same moment a large kaiman, the mother, who, without our seeing her, must have been watching us for some time, bobbed up among the branches under our feet to defend her youngster, and at the same time kicked up a frightful noise. I know nothing with which exactly to compare the awful row. It was not the roar of a bull or of a jaguar, or of any other creature known to me, but a mixture of this and something that chilled my very marrow bones. The noise had soon gathered other kaimans beneath us, that faithfully supported the angered mother while she repeatedly arose shoulder high out of the water to try and drag us off our footing. By dangling the arrow with his struggling victim in front of her, my companion increased the mother's rage still further. When wounded by one of our arrows she drew back a moment into the water, but quickly bobbed up again and renewed the attack with doubled fury. The hitherto smooth water was churned into a mass of foaming wave, owing to its being lashed with the bent tail, and I must admit that my pulse started throbbing twice as fast at the reptile's daring, of which up to now I had had no conception, and more particularly so on recognising close beside me a large ants' nest the occupants of which, becoming somewhat restless over the disturbance, kept crawling over our hands and feet. A single slip would have made one or the other of us fall straight into the open jaws of the creature. After using up our stock of arrows we thought the most advisable thing to do was to get back as carefully as possible. With outstretched neck the mother followed us to the bank where however she stopped. The animal is too timid to be of any danger on dry land where it even seems to recognise its defencelessness, because it will always take the quickest course to spring into the element of which it is the most dangerous denizen. The scales of the baby kaiman were quite soft and pliable: although it could only have been hatched a few days before it nevertheless had a strong musky smell. Not far from the spot we discovered a broad track leading to the former nest of the eggs, which was about 30 feet distant from the bank. This consisted of an excavation of the soil lined with bush, leaves, and grass: judging from the empty shells it must have contained from 30 to 40 eggs, laid in layers one above the other. Each layer is separated from the next by leaves and mud: a similar covering of mud seemed to have overlain the topmost. Kaimans hatch at the same time of year as turtles, so that they can crawl out before the commencement of the rainy season and not get destroyed by the rising waters. On their journey to the water they are not only waylaid by the larger birds of prey and the jabirus, but also by the male kaimans who seem to be especially fond of devouring the brood. Were it not for the largest part of the young being thus destroyed, they would be increasing at a fearful rate. The females are said never to bury their eggs in the sandbanks.

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* Macusis have told me that the Kaiman seizes the bigger fish at night when asleep. (Ed.)

660. Next morning several Indians accompanied me with gun and bullet back to the scene of the previous day's adventure. The mother, with her young, had disappeared. In spite of the numerous snouts that rose out of the water, and many attempts with large fish-hooks, we did not succeed in getting possession of a single specimen. On our return to camp, the Macusi Naripo (Kaiman-killer) who lived at the Inlet, asked me to leave the gun with him, because he would surely shoot an animal during the course of the day. Towards evening he came and told us that he had kept his word. The creature still lay in the water tied to a tree by a long vine-rope with which we dragged it on land. Its entire length amounted to 14 ft. 3 in., the head was 18 in. long and its girth around the eyes 20 inches, the circumference of the body on the other hand being 4 ft. 5 in. It might very well have received the large wound in the tail, which was already cicatrised, in the course of the furious onslaughts made by the males on one another, during the pairing season. Copulation takes place either on land or in flat spots on the banks. Of the 18 teeth, six were missing, while one of the forefeet was quite mangled up. From what the Indians told us, these mutilations were due to the voracious pirai, which would seem to be the only animals to trouble the full-grown kaiman. With his son Danappe, Naripo had only killed the monster with the seventh ball which had passed through the eye into the brain and smashed the skull. An overpowering smell of musk emanated from the carcass, particularly from the region of the genitalia. The dried penis is used by the Brazilians as a sure and common remedy for fever, for which purpose they pulverise it on the grater-like tongue of the *Sudis gigas,* and take with water. The kaimans which we met on the upper Essequibo, as in general on the savannah streams, differ a good deal from those on the coast not only as regards size, but also as regards appearance. The colonists and coloured folk call the latter alligators, *Champsa sclerops* Natt: they seldom reach a length of 6 or 7 feet, and have a more greenish colour.

The species found inland grows to a length of from 12 to 16 ft., is much blacker, and now and then shows yellow spots: the snout is shorter and more compact: the feet are also shorter and more powerful than in *C. sclerops*: it corresponds entirely with the black kaiman found by von Martius in the Amazon river, *Champsa nigra* Natt. The coloured people and colonists call it the kaiman.

661. Among fish that could still be added to my collections here I need only note the interesting *Doras niger* Val. and *D. carinatus* Val., the *Loricaria platyura* Müll. Trosch. and a small 2 ft. long *Sudis gigas,* that enabled me to forward to the Museum its skin, its skeleton, and a spirit-specimen: together with these I despatched a new species of *Exodon, E. paradoxus* Müll. Trosch.

662. Our camp at Wai-ipukari Inlet for some days before our departure displayed once more the lively and animated scenes that it had so often previously presented. All the neighbouring Indians, together with the wives and children of those accompanying us, had gathered round to say good-bye to my brother and Mr. Goodall whom they knew would never return.

663. As the forerunner of the rainy season had already set in some time before and the rain had fallen in torrents the last two days, we jumped into our three corials on 3rd May after a hearty handshake, a custom that the Macusi had adopted from us, and with all the crowd shouting "Tombawai, Tombawai!" (Good-bye) made our way up the already swollen Rupununi. The mouth of the Awaricuru was soon left behind. The western bank of the Rupununi in places consisted of thick forests while the eastern formed the edge of the savannah on which the grass, close to the bank, reached a height of 6 feet. In the far distance, the savannah was bounded by small hills and dense forest-flats. The dark foliaged Canuku Range rose more to the southward.

664. Our briskly undertaken journey soon met with a check that might have been attended with dangerous results: the largest boat ran up against a stump below water, and leaked so badly that it was only with the utmost effort that we managed to run it ashore before sinking. While the repairs were going on we noticed regular shoals of the tasty *Myletes Pacu* swimming upstream, which appeared to confirm the statements of the Indians and coloured people of the lower Essequibo that during the rainy season when all the streams overflow, the fish betakes itself to the upper reaches of the river, where it spawns in the still waters of the flooded savannah. These shoals proved welcome targets for our arrows.

665. The damage was repaired in an hour's time and without further delay we continued our journey until evening, when we pitched our tents under some huge trees on the western bank. The work was hardly completed when a terrible storm broke—the worst that I had ever experienced in the tropics. It seemed as if all the flood-gates of heaven were opened to let out their contents at one and the same time. The howling of the wind and the rolling of the thunder was all smothered under the noise of the downpour. Our people who no longer sought shelter beneath the giant trees, took refuge under our tents, which

afforded them just as little protection owing to their being unable to withstand such masses of water. All fires were extinguished, and the dense obscurity was only now and then torn asunder by the flash of the convulsive lightning. To prevent our corials sinking, we did not dare stop bailing out the rainwater for a second. Aiyukante, who once more happened to be in our party, and believed that in the downpour he had again found a good opportunity for convincing us of his powers over the elements, exerted himself in vain to exorcise the storm. As the sheet lightning shot through the horrible darkness one could see him blowing and shrieking away at the same time that he did his utmost by swinging his arms, and cutting all kinds of capers, to drive it elsewhere: he himself finally seemed to recognise that he had come off second-best, and growling and morose crept back into our tent. After some hours the rain abated a little, only to break out again subsequently with redoubled fury: the quantity that fell that night amounted to certainly 5 or 6 inches. The thermometer at break of day read 65° F. and the wet bulb 64.7°. Shivering and shaking with cold, we examined the baggage and started once more on the way. Here and there the bank was regularly covered with the beautiful *Maximiliana regia*. In the course of the morning we passed the mouth of the Maurukiamu, the banks of which were occupied by Macusis. According to the statement of the Indians, it takes its rise on the eastern spurs of the Canuku Range whereupon it wends its way through the savannahs to the Rupununi. While travelling in my corial along the western bank, I saw the head of a kaiman raised above the surface of the water: I at first took it for a piece of wood until one of my Indians taught me otherwise. Each barrel of my double-barrelled gun was loaded with two balls, and struck in the head, the creature lashed the water with a terrific twisting of its tail: turning round, it came so close to our corial that we were afraid of getting upset by the struggles of the dying brute. It finally swam to the bank when it sank, the shallowness of the water in its neighbourhood and the continually rising air-bubbles showing us the spot where it lay. We landed. A fresh shot in the head could not have killed it yet, because the furious movements commenced anew. At last these stopped and with difficulty it dragged itself nearer the bank so as to rest its head on land, where with a violent snap of the jaws and powerful blows of the tail, it looked done for. Just as we were busy slinging a rope round its body we heard a loud noise behind us, and a second kaiman with somewhat obliquely raised tail splashing up the water came rushing on towards us.

666. On recovering from our fright we made arrangements to drag the fallen creature, out of which the last spark of life seemed to have flown, behind the corial, but we had deceived ourselves, for the stunned vital powers suddenly returned and with a single blow, all six of us men who were dragging at the rope, were thrown flat upon the ground and in a moment the animal had disappeared under water, only to show its head soon after in another spot. A double charge of shot that pierced both eyes seemed to have finally killed it, and we dragged it quietly to shore. Its length measured 14 ft. 6 in. and its girth 4 ft. 3 in. As we

wanted to reach Curua Village by evening, I determined to drag the spoil obtained with so much difficulty as far as the settlement and get its skeleton there. We therefore tied it to the stern rope of the corial, but the rapid current and the addition of at least 300 lb. proved too great a load to manage, for in spite of every effort we were unable to get the vessel along. In order to concentrate its weight more on one point, the apparently dead monster was hauled aboard and we were already congratulating ourselves on our success when it suddenly showed signs of returning life. The jaws, streaming with blood, began to open, the tail again commenced to bend, and the Indians, shrieking wildly, jumped overboard and swam ashore. Not being a swimmer I was forced to remain in the corial close to the brute. The vessel was quickly carried down stream, till I finally managed to steer it ashore: before doing so however the animal had again flung itself in the water, but without freeing itself from the rope, with which we again dragged it to the bank. Its chase had now robbed us of several hours, the two remaining corials had already long passed out of sight, and the earnest warnings of the Indians to hurry up if we wanted to reach the village before night, made me give up my plans: but I wanted at least to keep the head. Although on land the monster was sufficiently recovered to be able to support itself on its front legs, and snapped at any one who approached, it finally succumbed to the cudgelling of the Indians in so far that I commenced cutting off the head, when, just as I severed the neck-joint, it struck out once more with such force that it threw down two Indians who were carelessly standing near its tail. It was about eight days before my hands lost their unpleasant musky odour. The kaimans possess this scent in the maximum degree during the pairing season, when one can smell the animal even if it is lying below the surface.

667. While the beast still lay in the water I saw several small scaleless eel-like fish settling on the wounds from which blood was flowing: they were as long as one's finger, with dark skins, a stumpy and broad head and small eyes beneath the cuticle through which they could hardly be seen. No sooner had the Indians noticed that I wanted to catch them, than they drew my arms back, and implored me not to touch them as they were especially poisonous. I was so affected by the striking signs of their fear and aversion that I gave up the attempt, and it was only on this promise that they let go. Unfortunately we had no net in the corial. From the description given by von Martius of a fish which is present in the neighbourhood of Para, where it likewise is generally feared, it would seem to correspond exactly with those seen by me, and to have also been a *Cetopsis*. When too late I was ashamed of my timidity. Some hours later we passed the first of the Rupununi rapids without accident, and an hour's run above them, close to the mouth of the Cutoka, on the eastern shore, we reached the landing-stage of the former thriving mission station of Curua. Curua is the Macusi name of the lovely palm *Attalea speciosa* Mart. that I saw here for the first time and is indisputably the most beautiful species of this interesting genus. The huge fronds which they bear straight up have a length of from 30 to 40 feet. They appear to be met with in British Guiana only on the Rupununi, and most abundantly in the immediate

neighbourhood of Curua settlement. Isolated specimens from these only follow the right bank of the Rupununi through the Canuku Ranges. We found the camp already pitched, and prevailed upon several of the Indians to go back with the empty corial and fetch the carcass of our slaughtered kaiman which I then in the morning placed far from the bank and regularly fenced in, so that the carrion-crows should not carry off the bones.

668. I have already reported that Mr. Youd, upon being driven from Pirara by the Brazilians, had come to settle here, but had not been able to enjoy his labours long, because they soon forced him from here also, and destroyed the fresh young crops. With the disappearance, without a trace, of the spiritual seed, innumerable *Mimosae*, *Solaneae*, and young Trumpet trees (*Cecropia palmata* Willd.) again covered the previously cultivated flats. The house of prayer, like the other buildings, lay in ruins amidst the rank vegetation. Christians had done this to Christians with all the hatred of the confessional.

669. The *Musa paradisiaca* and *M. sapientum* which on account of its rapid growth had escaped the general destruction, had reached a height of from 40 to 50 feet in the red greasy clay, and alternated with the groups of majestic *Attalea speciosa*. The appearance of the palm is considered by the Indians to be the surest sign of the most fertile soil. In one of the houses that was still occupied, although a large pool of water still remained in it, my brother found a man and two women who yet could not leave their beloved home.

670. With the completion of my fence already before daybreak, we left the razed mission station. A little above it huge grey gneiss boulders crossed the stream, and formed the Curuatoka Cataract which we got over without accident. The stone belonged to that coarse-grained dark-grey gneiss peculiar to the Canuku Ranges. About a mile above the cataract there branched off one of those natural canals—which we had found in such large numbers on the coast, but never, as yet, in the interior—through which the Rupununi is again connected with the Awaricuru some 11 miles from its own mouth; three miles further up, on the western bank, another and smaller canal led to a lake-like sheet of water which the Indians called Watawarai.

671. The farther we pushed along, and hence the nearer we approached the Canuku Ranges, the more did the number of bends in the river increase, and the better did the vegetation along both banks flourish. I greeted afresh the *Mora excelsa*, the ungainly *Bombax globosum*, and the *Brosimum Aubletii*, the Peira of the Macusis so sought after on account of its dainty wood: in British Guiana the Peira is peculiar to the Canuku Ranges only. Lovely groups of palms broke the uniformity of the dark green of the foliage trees. With a full display of lovely colours the often foot-long flower-bunches of the beautiful *Petrea volubilis* and *P. macrostachya* and the show of blossoms of the brilliant *Lundia Schomburgkii*, Klotzsch and *Allamanda Aubletii* Pohl., blended with the dark foliage, over which there likewise crept the dazzling red blooms of the *Cacoucia coccinea* and a lovely *Passiflora* that very much resembled *P. alata*. About three o'clock a commencing

thunderstorm compelled us to pitch our tents. In front of us lay the Canuku Ranges the summit of which was hidden in masses of dark cloud. The rain continued throughout the night.

672. The more unpleasant the night, the more charming the dawn. The rising sun was covered with that white transparent cloudy fleece so peculiar to the rainy season, and now and then cast its rays upon the millions of rain drops glittering like diamonds hanging from the trees, and which in association lent an enchanting freshness to the whole of the vegetation.

673. After passing, on the western bank, the mouth of the Camarapa, which also has its source in the Canuku Ranges, the latter received us within its boundaries. On resuming our journey we saw ahead of us an object bobbing to and fro on the surface of the water and again starting up perpendicularly a foot or two above it. It did not take the Indians long to recognise that it was the shaft of an arrow sticking into the back of some fish which, judging from the rapidity of its movements, must be of considerable size. We spent a long while in unsuccessfully chasing the shot spoil and then considered it an unnecessary waste of time to continue it longer. On the right or eastern bank we passed the mouth of the Mapare: above this, several granite rocks which the Indians called Maipure came into view on both water-sides. On account of the heavy downpours of rain, the stream was rising almost every hour so as not only to increase the force of the current but particularly our efforts to an extreme degree: it finally compelled us to take in our paddles and drag the corial along through the foam-flaked rush of water by hauling onto the branches of trees that had tumbled into the stream.

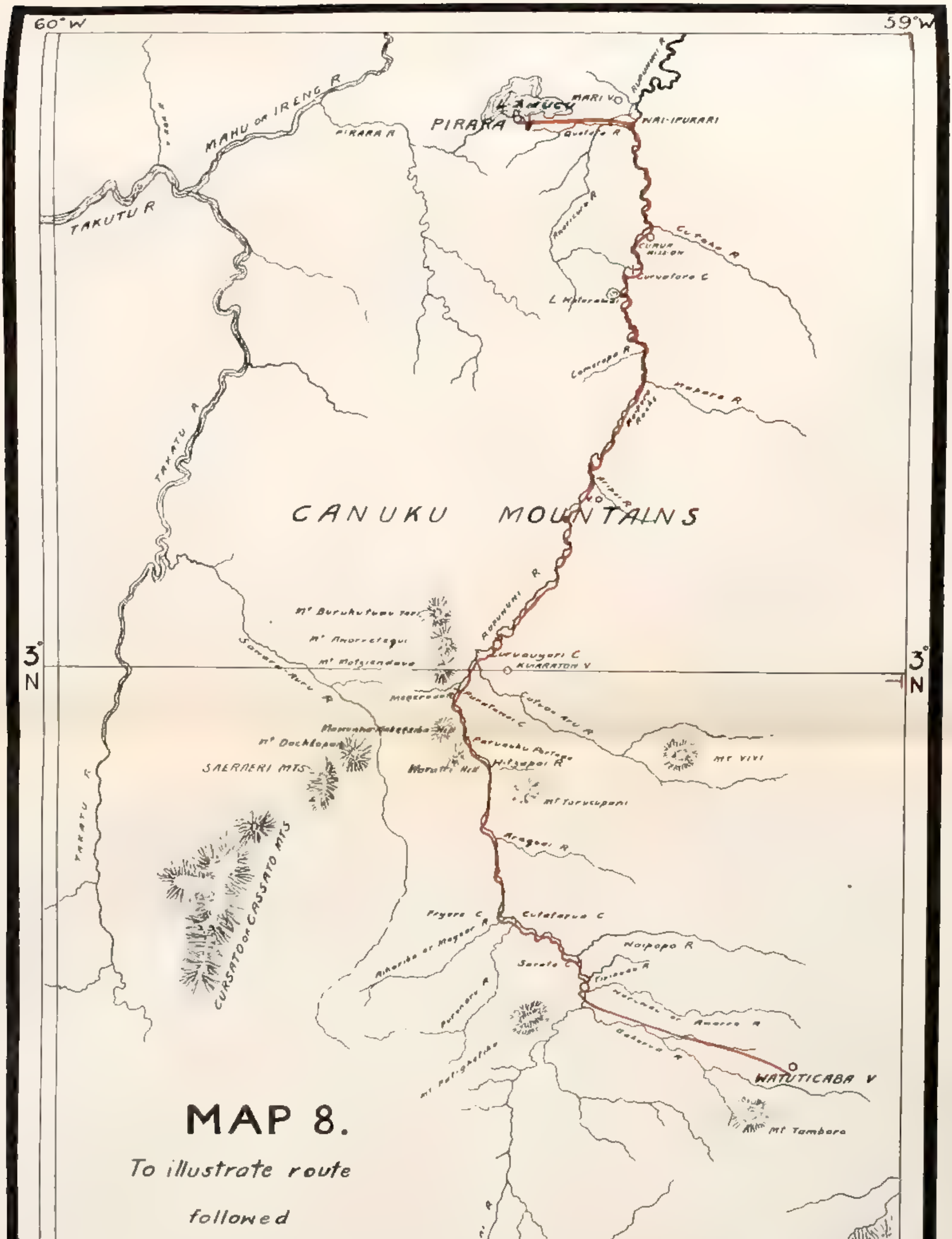
674. We soon got so exhausted at this work that, although it was yet early in the day, we were obliged to pitch camp at the mouth of the Aripai, a little creek that flows into the Rupununi here from the eastward. After recovering a bit we strolled to the small Wapisiana settlement of the same name, situate somewhat inland from the mouth, on the bank of this small tributary.

675. All the residents were collected in one of the houses, in front of which the old chieftain welcomed us in Portuguese, whereupon the others, almost all of them young people, shook hands with us. That the chief and his wife, still a beautiful imposing figure although already aged, must have lived long among the Portuguese was shown not only by their knowledge of the language, but especially so by the kind of greeting with which she welcomed my brother because, before he could prevent her, she had seized and kissed his hand. I confess that this ceremony turned me against the woman from the very first, and was more unpleasant than surprising. But I was astounded when, on entering the house, my brother was addressed by name by a young female in whom he at last recognised a servant of a Senhora Librada, a lady who was living at Fort Sao Joaquim in the year 1838. The young woman had fallen out with her mistress and seizing the first opportunity of leaving her clandestinely had sought asylum with the chieftain's wife a Paravilhana and relative of hers.

676. The houses had a bee-hive roof. Inside one, we found some women engaged in the preparation of a laba, while three men lay resting in their hammocks, without vouchsafing us a look, each one busily emptying as quickly as he could a large calabash full of the yellow plums of *Spondias lutea* Linn., the Maropi of the Macusis. Big heaps of firewood stacked in layers for the rainy season notified the foresight of the chieftain. The provision-fields, planted up with cassava, yams, cotton, and tobacco, that surrounded the settlement, were in an extremely flourishing condition and proved the fertility of the soil, a black mould mixed with sand. Near the mouldering stump of a *Bombax* that had a circumference of 25 feet and had been felled a long while ago, our attention was drawn to the equally mighty trunk of an *Icica altissima* which the villagers were anxiously shaping into a corial just with the help of fire and an old ship's nail that had already been fairly worn out by use: many a month might still have to pass before the herculean task would be completed.

677. The forest around Aripai consisted for the most part of the so-called cedar (*Icica*) of the Colonists. The timber has quite the colour, smell, and bitter taste of *Larix Cedrus* Mill. The tree reaches mostly a height of 70 to 80 feet and the completed corials made from it are considered to last longest, because the wood, on account of its bitter principle, is not attacked by insects. In Georgetown the timber is particularly preferred for furniture wood on account of its aromatic smell. The Macusis call the tree Paranguai: the Wapisianas Camiau. Although we did not find it in blossom, it is without doubt Aublet's *Icica altissima*.

678. After getting back to camp the Aripai villagers came in a body to pay us a return visit, when our articles of trade exercised such an impression even upon the three obstinate plum-eaters that they promised to bring us as much provisions as we could possibly wish for. We were struck with the peculiar custom among the young girls of wearing the hair cut short with the exception of a thin tuft on the crown until puberty is reached: it is only after this period that it is allowed to grow long. Owing to the unfavourable weather, I had been unable to air my collections for several days past, but as the next was in addition a Sunday, I determined to utilise it as a day of rest and revision. Unfortunately, the bitter experiences so often suffered were again repeated here and aggravated anew all those painful and depressing sensations of one's existence. The air, impregnated with an excess of moisture, and the almost unceasing fall of rain, had now once more commenced its work of destruction. On the first few nights of our journey up the river it was impossible to provide the plants with dried paper, because even our tent-covers had been unable to withstand the force of the downpour: it also could not be done during the day-time, even during the short favourable intervals, because our corials were not covered in. With beating heart I started on the work, to find my fears only too sadly verified. How I wished that some of the gentlemen who shrugged their shoulders in so strange a manner when I related the difficulties that had to be contended with in the preservation of my collections, and informed


60° W
59° W
TAKUTU R
MAHU or IRENG R
PIRARA R
L AMUCU
PIRARA
MARI VO
RUPUNUNI R
WAI-IPURARI
Quelefe R
Cupako R
CURUA MISSION
Curvatore C
L Haloraudi
Camerapa R
Hapare R
Rapids
TAKATU R
CANUKU MOUNTAINS
RUPUNUNI R
Mt Burukutuau teri
Mt Amorretegui
Mt Motgiendave
Sawara Auru R
3° N
Turuaugori C
KURARATON V
Mapereuar
Purefanai C
Cuvuo Aru R
Mt Dochlopan
SAERNERI MTS
Moruthi Hill
Paruachu Portage
Hitsapai R
Mt VIVI
Mt Turucupani
CURSATO or CASSATO MTS
TAKATU R
Aragoai R
Fryere C
Cutafarua C
Aikoriba or Magoar R
Waipopo R
Sarete C
Tirinnau R
Waruwai or Amarra R
Puranara R
Mt Polighattha
Baterra R
WATUTICABA V
Mt Tambora
Rupununi R
CARANAIMI MTS
Quitaro R
59° W

MAP 8.

To illustrate route
followed
From Pirara to Watuticaba
Vol 2. Ch X

V. ROTH, del.

them of the terrible losses entailed by an adverse climate in spite of all the sleepless nights during which, after a more than relaxing day's journey I had to dry my paper at the fire—how I wished that these critics might learn from their own experience what it meant, with the means at my disposal, to make collections in the tropics in thick and impenetrable forests, where often for a fortnight at a time not a human habitation is to be seen, and yet, notwithstanding all the heavy losses, preserve so much as I did for the scientific societies at home.

679. In the evening the hunters brought us one of those pretty deer which the Indians call Walibisiri. It is the smallest species met with in Guiana, hardly 1⅓ ft. high.

680. On the following morning the river had already overflowed its banks and as a result the water-surface proper was covered with large white foam-flakes from the trees uprooted by the raging current, while an almost continuous dull roaring sound indicated only too clearly that the mighty river was still continuing its work of destruction. The booming and the thundering on the river-banks, the crashing together of their timbers, the crackling and the breaking of the branches when the fallen giants banked up against one another in one of the bends,—all this in conjunction with the noise of the falling rain, had something so horrible about it that during the following night it scared us more than once out of our hammocks, until at last the water in the tent showed that the flood-water had reached up to our level, a fact that the darkness had prevented us noticing. Within 36 hours the river had risen 10½ feet, and it was still rising with every second.

681. The meteorological observations during our stay in Aripai gave the following results:—

Date & No. of Obsvns.	Instruments.	Average.	Highest.	Lowest.
From 6th May	Barometer... ...	29·667 in.	29·706 in	29·606 in.
to 7th May	Attached Thermometer...	77·72°	80·78°	72·14°
11 Observa-	Thermometer Dry Bulb ...	77·80°	81·20°	72·50°
tions	do. Wet Bulb ...	76·72°	79·70°	72·10°

682. Shortly before our departure from Aripai the inhabitants brought us about 30 cassava cakes for which the women asked beads, but the men knives and fish-hooks. A pretty little girl, fascinated by the sight of the beads, but who had not been able to bring any cassava, offered us her white hen and a little basketful of chickens. We gave her what she wanted without taking away her pets. This free gift came so unexpectedly to the dear little maid that she wonderingly looked for quite a while with surprised gaze at the beads, then at the hen, and finally at us.

683. After bringing the boats up to the tent we made our way in between the trees to the river bed where a number of jutting rocks and cliffs materially increased our labour, so that we could only progress inch

by inch. The current amounted to 6 knots an hour. The flakes of foam had changed the surface into a white moveable field of snow. Large flocks of mocking birds (*Cassicus persicus* and *C. haemorrhus*) that might not have expected this high flood swarmed with disquieting cry around their purse-shaped nests fastened to the branches overhanging the banks, while many of them had been reached or were already engulfed in it. Anxious screams rose from many a pair that were flying about to find their nest, their eggs, their young, while others to which the waters had not yet drawn nigh, continued hatching and feeding their little ones, or else carried along material for the commencing nests, and took no notice of the grief-stricken cries of their relatives. Life in this colony was a true representation of life in the larger cities: just like the latter, the birds had peacably built their nests in close proximity, without the one troubling itself about the sorrows of the other.

684. The nests of both species corresponded in the method of construction, but not in building material. *Cassicus persicus* builds its nest with the thread-like strips or filaments which it peels off from the fronds of the *Maximiliana regia* and *Mauritia flexuosa*, a work in which we saw hundreds of birds engaged on the palms growing along the banks. And with what skill they get possession of these strips! Hardly has it settled upon the leaf than the bird fixes the outer epidermis with its beak, loosens it at first a few inches from the tip, then flies down it with a peculiar rapid motion, and so pulls generally 3 to 4 ft. of thread off from it. *Cassicus haemorrhus* builds its nest only out of blades of grass and a white lichen. The latter had almost all hatched already, while hardly half the nests of *C. persicus* contained the two brownish spotted eggs.

685. Although the morning sky was only slightly clouded, it was about 10 o'clock when thick dark clouds again put in an appearance as they rapidly rose on the horizon, while the toucans, the sure harbingers of rain, sounded their notes, and the busy mocking-birds commenced their lively chatter. To the shrill whistle of the Buraeti or Carawui (*Rhamphastus Toco*) was now added to-day the more hoarse cry of a swarm of noisy falcons (*Falco nudicolis* Daud.) Notwithstanding the number of these garrulous birds that I have shot, I have never yet found in their crop or maw any flesh or small balls of hair, but always only fruits and berries: in the very great majority of cases the latter consisted of an orange-coloured berry that appeared to belong to a *Malpighia*. Furthermore, I have never observed them following another bird or a small mammal. Owing to its unpleasantly piercing clamour, the falcon is equally as hateful to the Indians as it is to the Colonists. The latter call it Bull-dog: the Warraus, Yacka-tatta, a word that resembles its note: but the word that comes nearest to it is that of the Macusis, Callau-callau. However much I may have wished to see one of those mighty eagles of South America, the *Harpyia destructor* Temm., the wish had hitherto never been fulfilled. I only knew it by its description and had seen its white ostrich-like body plumes only on the feather caps of the Wapisianas, who generally assured us that it belonged to the rarest of birds, a fact that was evident by the value the possessor of

such a head-covering set on it. Just as we turned one of the river bends, there sat one of these mighty birds upon the extreme tip of a giant mora looking proudly down on us. Sororeng who happened to be in the foremost corial took aim and shot: the king of birds slowly spread out its huge wings and flew off to the Ranges, the ball having probably never touched it at all. The Macusis called it Guan and assured me that it was the greatest enemy of the howling monkeys and that it dragged away deer and even children. It also hunts sloths and generally tears them away in pieces from off the clasped branch. Its nest, that it must be using several years, and which I only once saw, on a tree impossible to climb, is built upon the highest of them: it was as big as the nest of the *Mycteria*. In British Guiana the bird is found only in the district around the head waters of the Essequibo, and even here only very rarely. Its natural history is but little known.

686. The mountain scenery surrounding us had something uncommonly beautiful about it. In isolated places the river had forcibly broken its way through the ranges, so that in these the mountain heights became its banks, while the ridges themselves, extending farther back than others, formed surprisingly beautiful hollows covered with the most luxuriant foliage. This mountain-landscape proved still more lovely however as we came round a sharply projecting declivity which turned the river eastwards, and one of such natural amphitheatres, as if covered with a rosy red carpet, lay before us. Thousands of beautiful trees that we first found on the Scabunk, a tributary of the Takutu, covered the slopes of the mountains and banks with their bright rosy-red bracts and small blue blossoms recognisable a long way off. The *Calycophyllum Stanleyanum* Schomb. belongs indisputably to the most lovely ornamental trees of Guiana. Though among *Rubiaceae* this particular plant, as well as the *Mussaenda* and *Pinckneya* show the stalked leaf-like and coloured enlargement of one sepal, in no case does it take place to the same extent as with *Calycophyllum Stanleyanum* where the sepals hide with their wealth of colour not only the unassuming corollas but even the brilliant green leaves. It is remarkable too that this bract-like portion of the calyx only commences to form after the bloom has fallen, but it then develops with unusual rapidity.

687. The wood of this beautiful tree is uncommonly hard, of yellowish brown colour and bitter taste. I firmly believe that it could be employed as a powerful febrifuge. The Macusis call the tree Dehpoyeh.

688. Heaps of the pretty Sackawinkis (*Callithrix sciurea*) and little *Midas* monkeys (*Hapale Midas*), *Marmosets* of the Colonists, had chosen the magnificent foliage for a place of rendezvous and sprung sprightly and roguishly from twig to twig, bit off the dark rosy red coloured bracts, probably in presumptuous wantoness, and thereby littered the ground with lovely leaves.

689. Again to-day the continuous rain forced us to pitch our camp quite early, although a long search had to be made before a small dry spot was found on the eastern bank. In the course of the afternoon an Indian again noticed an arrow shaft keeping on the move above the

surface of the water. One of the Indians fortunately gripped it and with the assistance of several others, and to the joy of all, instead of the expected fish, a four-foot long Kaikutschi (*Champsa vallifrons* Natt.) was dragged up into the corial, where it was greeted with a shower of blows. The little animal defended itself with so much fury that it forced us several times up to the very end of the boat. In the meantime my brother's corial that had hurried on ahead had found a camp on the eastern bank, where we at the same time learnt that Sororeng had shot the kaikutschi which, diving into the depths with its arrow, had subsequently fallen into our hands, to be consumed by the Indians for a tasty supper.

690. A considerable number of the pretty *Midas* monkeys had collected in the trees under which we had pitched camp: their presence proved all the more surprising to us because we had hitherto only met with them on the coast where their depredations cause a lot of damage, especially in the plantain fields. I have only once seen this pretty little monkey tamed among the Indians, because it endures confinement for two months at most, though it very usually dies within the first few weeks.

691. The rain, still commencing violently in the evening, continued all night, and we were consequently not a little astonished next morning to find that the river had fallen over 5 feet and to see our big boat—it was 42 ft. long—with its stern jammed in the fork of a tree, and its bows resting on hard ground. In spite of the captain having slept in it, he had only noticed in the morning what had taken place at night. Having left the river bed and turned a bit into the forest, the captain had made fast the vessel between two trees which with the quick fall of water turned out to be but one, in the fork of which the corial was now fixed. It was only with a lot of trouble and labour on the part of all our men that we succeeded in getting the boat out of the wedge, and back into the river. This rapid change of rise and fall of the savannah rivers is one of the most extraordinary phenomena for which we have been unable to find an adequately valid cause.

692. Tired and exhausted with our efforts, we finally resumed our journey, and towards midday reached two giant masses of rock in between which the current rolled: they at the same time seemed to be the portal of a large arena upon which, in a long series of cataracts, the waves of the Rupununi struggled with one another in a fierce trial of strength. A look at this wildly thrilling motive force within its smiling frame made us almost forget the difficulties that stood before us. Stretching inland from the eastern shore and strewn with forest oases, was a savannah looking gay and joyous with its grass as fresh and soft as a velvet carpet. Towards the South-West there rose the thickly timbered ranges whence from near and far the brilliant rose-red streaks of *Calycophyllum* attracted our attention, while the different species of *Bignonia* with their hundreds of beautiful white and red flowers, and the *Lundia Schomburgkii* with its large yellow blossoms, cast the most showy change of colour over the deep green foliage. Mt. Burukutuau-yari with its rugged granite cliffs and peaks, closed the background of the lovely landscape.

693. In the neighbourhood of Mt. Burukutuau-yari, after having, like them, successfully surmounted the Curuau-yari Fall, I had again stopped the men sent on ahead with the boats, who had already pitched the tents on the eastern bank close to some huge granite rocks reaching down to the right bank: I stopped them in order to visit Kuiaraton, a settlement situate close by. It consisted of three houses. Some of the villagers, among them the chieftain, were away, engaged in the distant provision fields. I quietly betook myself to one of the houses to have a look inside—and what a shock I got on seeing some small-pox cases looking at me from out of just as many hammocks! One of the unfortunates who had got over the terrible disease, that had now spread so far inland, was already up and about once more. The scars that had been left gave the poor devil a still more revolting appearance while the large pits had taken on in general a dark black colour. They assured us that several had already succumbed to the plague. My brother had visited the village in the year 1838 on his return from the sources of the Essequibo, and had spent a fortnight in the numerously populated settlement:—but he hardly recognised it again. Small-pox is undoubtedly the most devastating and probably also the last scourge to seal the doomed extinction of the Guiana aborigines. Shocked and affected by the gruesome sight I hurried back to our camp. From a trigonometrical survey which my brother carried out in the afternoon, Burukutuau-yari rose 2,076 feet above the savannah, and 2,483 feet above sea-level: our camp was therefore 407 feet above the sea, and, according to the astronomical observations which the clear skies permitted of being taken to-day, its position 3° 1′ lat. N. and 59° 21′ long. W.

694. The new head-man, for the former chief whom my brother knew had died, paid our camp a visit in the evening with those of his people who had still remained exempt from the disease. Of unusual size for an Indian he had a fine powerful frame which the long piece of blue salempore, that he had thrown over his shoulder, after the style of a Roman toga, showed to good advantage. It was all the more ridiculous therefore to see how one of his companions had blackened the whole of his body with the juice of the Lana (*Genipa americana*), painted his face red with roucou, and then pasted white feather-down over it: he looked both frightful and funny at one and the same time. The remaining men were also big muscular people with fine Greek and Roman noses and a bold manly expression, characteristics which I have often noticed among the Wapisianas.

695. We prevailed upon one of these people to hasten on ahead to the Wapisiana settlement Watu-Ticaba, three days distant overland, to ask the residents to prepare a large quantity of cassava bread for us and at the same time to bring a portion of it to their landing stage on the Rupununi which lay a good day's journey from the village. My brother had also visited Watu-Ticaba in 1838. A second Indian was ready to accompany us in the morning and make us acquainted with the names of the mountains and tributaries of the Rupununi.

696. Among the beautiful flowering trees that aroused my especial interest to-day was the *Allania insignis* Benth., an earlier discovery of

my brother, which Mr. Bentham had named after Allan Cunningham, so celebrated in connection with the Australian and New Zealand flora. Like the *Calycophyllum Stanleyanum* it is also one of the most lovely ornaments of the tropics. The beautiful *Indigofera pascuorum* Benth., *Cassia uniflora* and *C. ramosa* Vogel, *Faramea longifolia* Benth., and *Coffea crassiloba* Benth., alternated with the white snow-covered blossoming *Eugenias* and *Psidiums.* The palms had entirely disappeared from the banks since the day before yesterday.

697. In the morning (10th May) the thermometer was 83.3° F.: the wet bulb on the other hand 79° F. This difference of 4.3° showed plainly that the air was less moist than the day before, a fact that was also demonstrated by the rain having ceased during the whole of the night.

698. Shortly before our departure we received another visit from 40 Indians, men, women, and children, the residents of a settlement in the close neighbourhood. Among them was a woman far advanced in years, wasted to a skeleton, with long white hair who was still further remarkable in that her whole body was dotted with irregular isolated whitish, often also snow-white, spots from the size of a pea to that of a walnut which, on the back changed to a yellowish-white colour. The spots appeared in the greatest number on the abdomen: from their scaly lichen-like nature, they were a sequel of the frequent skin-diseases with which the Indians are afflicted.* She was also an old acquaintance of my brother, who in 1838 gave her hardly a month more to live. By devoting her whole love to a bonny young mother with infant in arms, and never leaving her side, the contrast between frail old age and the perfection of vigorous youth became all the more marked.

699. There followed upon the rainless night a morning the like of which only the lively imagination of a poet can at all portray. The refreshing and lovely perfumes of the foliaged mountain-slopes were wafted over to us on the strong south-east breeze, while the forest-crowned summits proudly raised their stately heads already glowing in the morning sun and repeated the thunder of our guns a thousand times over in a rumbling echo that finally faded away in a soft murmur: to the intense joy of the assembled Indians we had fired them off when pushing away from the bank. After this enchanting idyll there followed the contentious epic: during the course of the day we had to surmount the Curnayair (Bent Fall), Ruru-ruru, Tremitre, Trekutara-tepau and several other Falls. The Matziendaua Mountains formed, on the western bank, the south-eastern spur of the Canuku Range: they extended N.N.W. and were connected with the high Awarre-tequi and Burukutuau-yari. The small mountain stream, the Méneruau meandered along their base. Opposite the Matziendaua Range, the Catuau-aru, which has its source in the savannah south-east of Mt. Tarucupani, empties into the Rupununi on the eastern bank: Mt. Burutuau-yari lies N. 27° E. from its mouth.

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* The condition described here is probably the result of an old impetiginous infection of the skin, which sometimes leaves areas of pigmentation. (F.G.R.)

700. On the farther side of the mouth we again stepped out of the range, onto the savannah that spread out before us in a fresh and youthful garb. The rain had recalled to life the entire fulness of a tropical vegetation's activities. Trees and plants looked as if revived anew, and the invigorated soil exhaled a pleasant fragrance. A new green carpet of turf and flower covered the previously monotonous yellow-bleached savannah flats, above which the proud Mauritia again raised itself afresh, while the picturesque Mararen tree (*Copaifera*) with its smooth grey trunk and densely foliaged wide top spread its mighty limbs over the vegetation on the banks.

701. While the boats were being dragged over the rapids that continued as numerous as ever I reaped a harvest in this beautiful flower garden where I found many a form hitherto unknown to me.*

702. Vigorous *Agaves, Bromeliae, Cacteae, Melastomaceae,* the *Vernonia odoratissima* Humb. Bonp. and the dainty *Palicourea rigida* Humb. Bonp. that was spread all over the savannah, as well as the beautiful *Cyrtopodium Andersonii,* thrived up on the huge granite mounds that continually stretched inland. A bright red diffused colour that nodded at me from in between these rocks turned my steps in its direction: it was the blossoms of a wonderful *Gesneria* with 3 to 4 ft. high flower-stalks, and was new. The bulbs of *Gesneria Schomburgkii* Kunth. fortunately reached Berlin. The beautiful *Calycophyllum* had almost entirely disappeared: only here and there one saw an isolated specimen shining out of the fresh foliage green. The sweet-scented *Cyrtopodium parviflorum* and *cristatum* covered entire flats. Both have this peculiarity that with *Paepalanthus capillaceus* the flowering stage is immediately brought about by the burning off of the savannah whereas with the case of legumes, except the above mentioned, it becomes destroyed. Shortly after the fires are extinguished, and especially if followed by rains, flower-stalks appear on the bulbs, and are already found in bloom long before the plant commences to force new leaves. It was only rarely that I came across specimens bearing leaves and blossoms at one and the same time.

703. On the western bank we were greeted in the far distance by our old friends the Saeraeri and Cursato Ranges which, covered in a bluish haze, rose out of the W.S.W. On the north-easterly point of the Saeraeri a curious pyramidal almost isolated mass of rock attracted my particular attention: the Wapisianas called it Dochlopan. About 12 miles off, in front of a long mountain chain, was to be seen a hill of medium size which they called Vivi, where plantains were said to be growing wild in considerable quantity: they declared that up to now no Indians had lived on the mountain, and that Makunaima had planted them there.

704. Late in the evening we managed to get over the great rapids at Paratawai. The eastern bank was without brush-wood or trees, so

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* Amongst these were: *Melochia oblonga* Benth., *Eupatorium subvelutinum* ,DeC., *E. conyzoides* Vahl.. *E. ixoides* Benth., *E. Schomburgkii* Benth., *Porophyllum latifolium* Benth., *Licania crassifolia* Benth., *Crotalaria genistella* Humb. Bonp., *C. anagyroides* Humb. Bonp., *C. leptophylla* Benth., *Tephrosia toxicaria* Pers.

that the poles for the tents had to be fetched out of the forest that encloses the base of Matziendaua.

705. On the morning of 11th May four of our Macusis had disappeared. The difficult and dangerous work at the falls and rapids, the reduced rations, and the certainty that every fresh day would be piling up new troubles on the old, had prevailed upon them to leave their wages behind and seek fresh fields: the entire absence of rum, that marvellous remedy for an Indian's every mood, may also have contributed a good deal to their defection. But as these four individuals were the idlest and laziest of the whole company, we did not have much to growl at when they ran away, though we were afraid of something worse—the bad example—and this had to be prevented. My brother therefore gathered them all round him in a circle, and appealed to their sense of honour not to leave us in the lurch, when we would indeed have found ourselves in a sorry plight. "Of your own free will," said he, "you followed us: none of you were forced to go, but now four of you have broken your word and run away like a thief or a night murderer (kanaima)." The experience, he continued, had pained him. He did not wish to learn that his friends the Macusis were liars. With this, he let everyone withdraw his word, and everybody who wanted to return home was free to stand forward and say so openly, but not to seek flight like a cheat, for conduct such as that would be unworthy of the honourable Macusis. They stood around us in silence, with down-cast eyes and none stepped forward out of the circle, but each returned quietly to his work, although the more we pushed on to-day, the more numerous and dangerous were the rapids. During the dry season the river must be fairly overgrown with the bushes of *Psidium aquaticum* Benth.: on the present occasion only their tips emerged above the roaring surface of the water, and were of no little assistance in surmounting the smaller rapids, because they served as points of support up to which we could drag the corials behind us.

706. In the course of the forenoon we reached the well-known portage of Paruauku, by means of which one can reach the already mentioned Sawara-auuru, a tributary of the Takutu. This portage is a low savannah stretching W.S.W. to the Saeraeri Ranges, on the eastern slope of which the Sawara-auuru takes its rise. The eastern peak of this range was situate S. 73° W., some 10 to 12 miles away, the highest point of the Cursato Range S. 65° W., and of Burukutuau-yari, at the foot of which we spent the night, N. 20° E., 5 miles distant. In the neighbourhood of this portage, already known a hundred years ago, some scattered hills rise from the savannah. The first to cross them was the surgeon Hortsmann of Hildesheim in 1739 full of hope of being near the yearned-for treasures of gold and diamonds, the dreamed-of El Dorado, which the mountains, that he noticed to the northward, must be hiding. In 1775 he was followed by Don Antonio Santos in his journey from Angostura to Para, and by Don Francisco Jose Rodriguez Barata in 1793 when he was sent by the Government on matters of state from Para to Surinam. My brother, in the course of his journey in 1838, saw just as little of those "rochers couverts de figures ou de varias letras" mentioned by

Hortsmann, as we did on the present occasion at the small cascades which he says the Rupununi possessed in the neighbourhood of the Makarana (Makarapan) Range, along the southern slope of which it winds: because, except for a single trifling rapid, which however is visible only during the dry season, the bed of the lower Rupununi up to the Curuatoka Rapids is nowadays free of all stone dams, and essential changes must have accordingly taken place in its lower basin since 1739. It were quite possible, with the breaking through or washing away of the rocky cliffs, that those "rochers couverts de figures" which we looked out for in vain from its mouth to the spot mentioned* would be destroyed.

707. Close to the portage and reaching to the Rupununi are some small hills which the Wapisianas called Mawunna-meketsiba which might mean something like Eye Hills, though they could not supply us with the reason for the name: intimately connected with them was a larger hill Waratti. At 1 o'clock we found ourselves opposite the southern point of the Canuku Ranges, which the Indians call Tarucapani, that rises on the eastern bank. On its northern base the small creek Witzapai falls into the Rupununi above which also a rapid drew many a drop of sweat from us: on its southern base we found the mouth of the Araquai. Beyond it, a thick group of trees beckoned at us so invitingly with its cooling shade, that by 3 o'clock we had already pitched our camp there. Evening closed in upon us with one of those fearful thunderstorms that already had so often made our hearts beat. It was lucky that we had chosen the group of trees for a night's lodging for without the protection of their thick tops the raging storm would without doubt have carried the tents up and away. Even the corials, during the uproar, were in danger of sinking. The thermometer at break of day registered 70° F.: the wet bulb only a difference of half a degree. The river had again risen about four feet.

708. With every forward stroke our difficulties increased until finally the paddles had to be taken in, because the rapid current was too strong to pull against: indeed we were sometimes drawn back by it and only saved from sinking by holding on to trees that had been thrown down. These and the bushes once more reaching to the water side proved the only means that enabled us to proceed. The Rupununi or Camoyepaugh (Sun River) as the Indians also call it, had up to now lost only a little of its width, because it still always varied between 250 and 300 feet. The pretty *Calycophyllum* was replaced by the beautiful *Elisabetha coccinea,* its scarlet blossoms and scarlet-red velvety seed-pods lending a brilliant colouration to the landscape. Although this lovely tree gave our eyes cause for congratulation, the *Genipa Caruto* Humb. Bonp., the Rucu of the Indians, overladen with its tasty product evoked louder expressions of delight amongst our companions, who, with a cry of "Ruku, ruku," jumped as quick as lightning into the river to climb the tree and get possession of the fruit that reached the size of a

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*.—See A. von Humboldt; Voyage aux régions équinox, etc., Book VIII, Chapter XXIV p. 238.

medium apple. A third interesting tree was the *Swartzia tomentosa* DeC., the Ironwood of the Colonists and the Palo santo of the Portuguese: the bark contains a red balsamic principle, used by the aborigines as a sudorific. After the tree has been felled the timber has a red brown colour, which later on however changes to a deep black.

709. Besides the *Genipa Caruto*, the *Inga* supplied us with a glorious delicacy because upon almost every branch there lurked an iguana upon which all arrows were immediately directed. The majority of the females had from 18 to 24 eggs in the ovaries.

710. Just as we had negotiated a dangerous fall, one of the Indians noticed a Giant Ant-eater that had come down to the river to drink. When the animal became conscious of the danger threatening, it clambered up the bank and hurried to the savannah. We quickly followed after it, but in our excessive haste left the gun and other weapons behind in the corial. The swift-footed Indians soon came up with the fugitive which, in the absence of other weapons, they tried to kill by pelting it with stones: in peculiarly piteous notes the apprehensive creature repeated the many manoeuvres which I had noted on previous occasions, until, when fatally hit with a stone, it tremblingly tottered a few steps forwards and fell dead all of a heap. It was again a female, which strengthened me anew in the opinion that these edentates are close upon extinction. During the hunt my brother had stopped at the mouth of the Camai-kariba or Maycar, which joins the Rupununi on the western bank, to pass the night here because the third corial, in which were Mr. Fryer and Goodall, was still behind. It just appeared on the summit of the rapid already lying past us when, as quick as lightning, it was drawn down the fall again and disappeared from view. At the very instant that it was dragged back by the current, we saw the crew jump into the river and the corial abandoned to its inevitable fate. We believed that Fryer and Goodall had themselves gone: it was a frightful moment until the sight of the uninjured quietly rocking corial relieved our anxiety. The presence of mind of Sororeng and two other Indians who had not left their posts had saved the lives of our companions, the vessel, and its baggage. A real deadly pallor covered the faces of our friends as they came up to us, but then they had stood nearer to death than ever before. As they reached the summit of the fall, and wanted to cross the stream, the strength of the crew was exhausted, the boat could not be moved from the spot for some seconds, and with the sinews of the paddlers completely relaxed, it was dragged down the stream again. The cataract that brought such danger in its wake and for which the Indians had no name, was on this account christened Fryer's Cataract, and is so marked in the map.

711. During the night the pouring rain never stopped for a moment, and the rising flood had fairly reached up to us by dawn. About eight o'clock in the morning it slackened a bit, and we quickly struck camp to resume our journey. During this interval my brother had climbed a small rise near by, from which we saw him hurriedly return: behind it he had seen the water just like a wall rolling along the savannah towards us. In frantic haste we therefore tore down the tent and threw luggage

and linen higgledy-piggledy into the corials, or otherwise the raging flood had caught us. It is indeed a strange sight to see such a wall of water wheeling before it everything that cannot withstand its giant strength on the path of destruction.

712. A boisterous blustering noise, which we had already heard during the night over and above the falling rain, indicated the neighbourhood of the biggest cataracts of the Rupununi, the Cuta-tarua or Truan of the Wapisianas, the Cartatan or Corona of the Portuguese. We soon reached the mighty fall. A huge granite wall, over which the now rebellious masses of water rushed down in a deafening roar, ran through the river bed in an E.N.E. direction. Although the height of the water had much diminished the danger of climbing over, the raging torrent forced us to empty the corials, carry the luggage along the bank and haul the vessels over with a rope. Near to the eastern shore were to be seen a number of isolated granite masses that were rendered conspicuous by the numerous circular holes that covered their upper surfaces and sides. The rain had already abated a little and the sun's rays soon found their way through the riven clouds: this was all the more welcome as I had not been able to spread out my collections for several days past. This was what I did to-day with a sorry heart because, since Aripai, the moisture had again continued its work of destruction on a large scale. My entomological and botanical collections particularly suffered damage, the boxes containing the "trade" such as cotton, shirts, knives, scissors, etc. meeting with a similar fate. All iron and steel articles were covered with a thick rust. In order to prevent it from spoiling altogether, everything was spread out on the rocks and exposed to the sunshine. Having no time left to clean the skeleton of the ant-bear, which had been brought here for the very purpose, I was unfortunately forced to hand this business over to the carrion crows on one of the uppermost crags. A large tree-trunk that lay on one of the highest spots of the cataract-dam showed that the water level had by no means reached the height that it must now and then touch, because a space of 15 feet still intervened between its present surface and the place on which the huge tree was resting. Close by the water-side a snake that was just then engaged in swallowing a fish somewhat too big for it, fell an easy prey to me: it was *Homalopsis angulata* Schleg. The Indians considered it poisonous, a property which they often assigned to the most harmless snakes, on which account they could only be trusted but little in this respect. Later on, I found yet more specimens of this pretty water-snake, but the brilliant red colouring that encloses the brownish patches unfortunately fades away completely in spirits.

713. Beyond the cataract we passed the mouth of the Purunaru which pours into the Rupununi from the S.S.W. In 1838 my brother knew it as a little stream, but now, on account of the high water-level, it was of the same size as the Rupununi. Immediately opposite its mouth, the Waipopo falls into the main stream on its eastern bank.

714. Towards 6 o'clock we reached Sarata Fall. Here also, upon the eastern bank, mighty, often 60 ft. high, masses of granite extending inland

put in an appearance: we pitched our camp at their base. From their summit we got a view of a sunset so rarely seen in the rainy season. Encircled by golden clouds the sun sank in a glow behind the Cursato Ranges, the slopes of which were already enveloped in a grey veil of mist, while its parting rays still kissed their summit for long. It was a beautiful picture, more beautiful than it had been for a long while. The eastern crest of the Saeraeri Range rose far away beyond the ashen sea of haze, and sombre Dochlapan gazed down in pride upon the plain of mist. In the north, the horizon was still bordered by dark masses of cloud which, on account of the moon's disc just then rising in the east, appeared still blacker and gloomier: the rain-storm that had passed over us was yet raging over there. Peace reigned over here. In the south-east the immense savannah flat was bounded by the Carawaimentow Range, which stretched from N.E. to S.W. According to the account given by the Indians, the Rupununi must take its rise here, but Mr. Youd assured us that this was to be found in an extensive savannah some 23 miles south-west of Watu-Ticaba. The Carawaimi (Carawaimentow) Range is unquestionably the Sierra Tamucunaque of our maps. From its source the Rupununi strikes at first a north-westerly course until Mt. Patighetiku, on its western bank, forces it to give this up. A few miles further on it paves a way for itself through granite masses roughly disposed in superincumbent layers by means of which it branches into a number of canals, that join up again to form a stream and, as a mighty waterfall, pours over the granite belt just mentioned, the Cuta-tarua lying abut 160 geographical miles distant from its mouth. The whole length of the river amounts to somewhere about 220 geographical miles. It must take its rise in 1° 50′ lat. N., and on account of its describing almost a half-circle, the source and the mouth lie in almost one and the same meridian. From where we were we could follow the snake-like course of the river far through the immense flat.

715. With hungry stomachs and the keen expectation that we should find in camp the huntsmen whom we had despatched in the morning laden with spoil, we withdrew from this delightful gratification of our senses and returned to our quarters. Our hopes were fulfilled. The hunters had brought home two fine head of deer, which were just as welcome to us as it was to our Indians because the last remnants of the provisions had been already distributed that very morning. Their hunger was so great, that they did not cook the flesh at all, but spitted it on wooden skewers and roasted it over the fires during which innumerable insects and amphibians started a concert of a thousand voices, the very like of which we had not heard for a long while past. But however pleasant the evening may have been, the night turned out to be all the more troublesome on account of the painful bites of a small, I might almost say invisible, *Simulia*. All coverings in our hammocks proved useless in preventing the burning and painful stings of these pests, because they still found the way they sought to our flesh. The hair was just as ineffectual in keeping these tormenting devils away from the skin of the head, upon which their bites caused unbearable pain. This small insect, of which we had had no previous experience, worried us until sunrise,

and reminders of the night of torment remained several days longer in the dark red dots on our skins. Day broke with heaven and earth covered: the former by gloomy clouds, the latter by their products. The river had completely overflowed its banks, and the savannah had changed into the basin of a huge lake upon which we were able to continue our journey with far less effort. Huge trees, which the current of the stream had uprooted, mammals that the flood had taken by surprise, snakes and lizards that had been unable to escape the rising water, friend and foe of the animal kingdom, drifted past us: white cranes, storks, and other water-birds sat upon the tops of the foliage trees and stately *Mauritias* and gazed upon their favourite element while some deer, that had sought refuge from a watery grave, either stood or lay in the luxuriant grass upon the rises that the flood-waters had not yet reached. On approaching such a place of refuge, the shy lot would spring up and make a bolt for it until stopped by the water-edge when, with a steady stamp of the front limbs they would turn back to look at us, or else attempt to jump into the flood, out of which they nevertheless quickly returned to dry land.

716. We could not let this favourable opportunity slip without taking advantage of it. Two of our Indians, armed with guns which they held with one hand above the water, swam off to one such island, but had hardly reached it before the deer, in still wilder hurry, sprang into the flood and away they went. A solitary one, however, had remained and now withdrew into the high grass, where both Indians tried to stalk it like cats upon their prey. After a while the anxious creature raised its head again, looked carefully around, and not noticing its pursuers, continued to graze afresh. A report and the animal's desperate jump into the air told us that the huntsmen had completed their task. The returning victors were welcomed amid laughter and the game placed in the corial.

717. When the savannah waters proved too shallow in places for our boats, we were of course forced to return to the river which nevertheless was always attended with plenty of difficulty, because we had first of all to cut a way through the dense river-side growth with axe and cutlass. Thousands of ants that had fled from a watery grave up the trees and larger bushes, made this work none too pleasant, owing to the fact that at every blow thousands fell upon us and into the corial. In spite of the knowledge that we would have to break through this fence again, we nevertheless immediately returned to the flooded savannah as soon as the depth of water there allowed of our doing so at all. The masses of granite still remaining exposed above the surface of the water were covered with numerous specimens of *Gesneria Schomburgkii*, while the *Genipa Caruto* in isolated spots grew beside the rocks. We spread our breakfast table upon one of these granites and at the same time fired our mortar, to notify our arrival to the Indians who were probably collected at the landing-place for Watu-Ticaba, in the neighbourhood of which we were told we now were.

718. By afternoon we had got so close to the Waruwau or Awarra, which coming here from the N.E. flows into the Rupununi

some miles above the river Tiviruau, that we could clearly distinguish two shelters and several Indians on a slight rise not far from the water-side. Our whole attention, however, was centered on a figure who stood from 6 to 8 paces apart from the others, was dressed in white, and, as could be confirmed by telescope, was decked with a red cap: in his right hand he held an open umbrella high over his head, even though in view of the sunshine so little rain was to be expected. The most extraordinary conjectures forced themselves upon us concerning the personality of this curiously equipped figure. The nearer we got, the more carefully could we examine the dress of this statuesque personage, on whom we now recognised a long dagger, without sheath, stuck into his broad waist-belt.

719. Just as we landed the extraordinary individual closed his umbrella and came down the rising ground towards us, the other Indians following him at the same time at a respectful distance. All our surmises about discovering some adventurous European or other interesting personality disappeared as we got close by and one of the Indians recognised him as the chieftain of Watu-Ticaba. We could now enjoy a good laugh which we could no longer restrain over the wonderful metamorphosis which the vain Indian now presented, for the old man looked too ridiculous. The lanky limbs of the big gaunt figure were stuck into a pair of sailor's trousers that had been white once upon a time, but which hardly reached down to his calves: a long piece of blue cloth, through which the sheathless dagger was stuck, was slung around his loins like a scarf: a red woollen cap with long yellow tassels covered the head with its large aquiline nose and no less large mouth, and the right hand swayed the blue umbrella in proud self-confidence.

720. My brother recognised in the dagger an old acquaintance which he had seen worn by the chieftain Siruai who accompanied him on his journey to the sources of the Essequibo in 1837. Siruai had died, and the sheathless weapon fell as a royal heirloom to the succeeding chief Wayapari, who now wore it with the same pride as his predecessor. Wayapari had himself brought back the umbrella from a journey to the lower Corentyne which, by means of the portage Primoss, he had reached by water, where he had found it with a timber-getter from whom, having set his whole heart on it, he had traded it. The original handle that he had broken some time before, was replaced by a forked twig: but as neither he nor his subordinates knew the purpose of the article, the owner, infinitely self-satisfied with his possession, strutted about with it on every festive occasion, provided that it was not raining.

721. His companions were the same fine robust manly figures that I had already often noted among the Wapisianas, with regular features and boldly curved aquiline noses. They wore a sort of peg, made of wood or bone in the perforated under-lip: they carried 6-inch long rounded little sticks, the ends of which were decorated with feather bundles, in the ear lobes.

722. They had done far more than actually carry out our wishes conveyed by the messengers, to bring provisions to the landing-place at

the mouth of the Waruwau, because we not only met with a considerable supply of cassava-bread, but also a quantity of yams, bananas, and pines which we forthwith shared amongst our hungry companions.

723. After Wayapari had handed these provisions over, he withdrew to one of the shelters, removed his trappings of state, wrapped the umbrella and dagger carefully in with them, and then returned to us in his natural costume.

724. As the inhabitants of Watu-Ticaba had never seen such huge vessels before, those of ours aroused their utmost wonder, but what excited it still more was our mortar which, to their infinite joy, we several times fired. Our tents were quickly pitched on the small spot of rising ground, and just as rapidly there blazed a number of fires at which the brown figures rested and roasted their plantains. The evening was just as beautiful as the one before. After sunset the whole sky was covered with a deep blue, which towards the western horizon changed into a still deeper purple red. In the close and distant environs, both visible and invisible amphibia and beasties repeated their 1,000-voice concert, and millions of phosphorescent insects rose from the damp savannah, although the flood waters had not yet reached it, and ploughed through the azure atmosphere in spasmodic flashes or fantastically twisted coils and circles. I had never yet seen these little creatures in such numbers: the time of year and swampy flats may have exercised a special influence on their development: but the painful and troublesome attacks of the little black *Simulia* proved so overpowering as to drive us out of the hammocks and force us to keep on one continual move until the morning. Verily, words can hardly describe the sufferings that we had to endure from these wicked creatures: their number was so great as to make it impossible to take astronomical observations.

725. In cloud and gloom the longed-for morning broke, when we at least obtained some relief from the burning and itching wounds, by taking a bathe. About eight o'clock, but just for a moment, the sun worked its way through the dark layers of cloud, and then cast its enchanting strong-lights upon the luxuriant surroundings. Large flocks of carrion-crows circled in proud flight high up in the air, to swoop down upon our camp at the very moment that we should leave it.

726. The meteorological observations at the mouth of the Waruwau, 432 feet above the sea, gave the following results:—

Date.	Hour p.m.	Barometer.		Thermometer.		Remarks.
		Inches.	Attached Thermometer.	Dry Bulb.	Wet Bulb.	
14th May	4.30	29·575	86 degrees	86·4 deg	79 deg	Fine weather.
	5	29·57	86·9 ,,	87·6 ,,	80 ,,	Sky partly clouded. Six o'clock a small shower of rain.
	6	29·571	77 ,,	77 ,,	75 ,,	
	6.30	29·59	77 ,,	77 ,,	75 ,,	
	7.15	29·602	76·82 ,,	77 ,,	75·2	

727. Two miles above the mouth of the Waruwau and also on the eastern bank, there opens into the Rupununi, the Bakurua which would give a second waterway to Watu-Ticaba were it not that on account of the many cataracts it is impassable. As we could get many miles nearer to Watu-Ticaba by the Waruwau or Awarra, we commenced pulling up the latter in spite of the innumerable difficulties that we had to contend with. It was only with the help of the axe that it was possible to clear a miserable passage for the boats. In brotherly fashion the trees on both banks clasped their limbs in one another, and prevented even the most inquisitive sun's rays from peeping through the thick texture of tops and twigs. Creepers, orchids and ferns in exceptional abundance covered the old tree-trunks with a trickling felt, while the delicate young roseate leaves of *Elisabetha coccinea* formed pretty breaks in the sombre foliage. The ripe fruits of a *Eugenia*, which in size and taste bore much resemblance to our sweet black cherries, supplied us Europeans with a grand cordial. The Indians collected the fruits of the *Mauritia flexuosa* which, wherever the savannah reached the bank, it decked in picturesque groups. It was soon a matter of impossibility to proceed any more with the boats: an insurmountable cataract already thundered from the distance, "So far, but no farther."

728. We landed at the spot for the overland branch-off to the village where the chief, who had started with his people at daybreak on the road across the savannah, was awaiting us.

729. Innumerable granite rocks, often 80 to 100 ft. high, heaped one upon the other in the most bizarre and extraordinary fashions, and wreathed around with *Clusia, Gesneria, Orchidea, Tillandsia, Cactus* and *Melocactus*, crossed the stream and the savannah in all directions. However much I was attracted by the picturesque and wonderfully pretty landscape, my whole frame nevertheless trembled with horror on noticing amongst the wanton wealth of vegetation that dangerously irritant plant, *Cnidoscolus Marcgravii*, that had given me so many a painful hour on the Zuruma. Its dangerous properties seemed here to have driven even other plants out of its neighbourhood, because it alone occupied the terrain upon which it was found. After we had unloaded our boats and arranged the baggage for land transport, night fell and with it again intense rain which did not cease until 11 o'clock next morning. Daybreak brought us still more villagers from Watu-Ticaba who wanted to help carry our goods.

730. As I had to return to Georgetown from here again, we had already been building since yesterday a substantial shed, where I left my collections and other objects which would not be required during our stay in the village. Precautions were taken against the rain: but against thieving hands they would be even as safe, if not safer, than in the most substantial warehouse. Towards 11 o'clock we wended our way to the village in bright sunshine. The huge masses of granite now became mighty charcoal heaps, for hardly had the sun cast its scorching rays upon the wetted rocks than they gave rise to thick clouds of steam which lent quite a peculiar character to the entire surroundings. I had

often previously observed this interesting phenomenon on several occasions after nights of strong dew.

731. Just as our expedition made a move, chief Wayapari appeared out of the scrub near by in full court costume and led the long procession. We had hardly put an hour's journey behind us when heavy rain set in again, and Wayapari had nothing quicker to do than pull off his clothes, and pack them carefully up, the umbrella included. The path soon after led through a *Mauritia* swamp, where we often sunk up to our armpits in the bog, and then over hills covered with small sharp-cornered bits of quartz and granite and furrowed by small mountain-streams which the continuous rains had certainly changed into raging torrents with the result that their passage was even more difficult than wading the morass. Here and there the waters shot over the rugged reddish rocks appearing above the surface, to form picturesque cascades. If we had not had so good and safe a guide as the old chieftain, several serious accidents might have occurred in to-day's course, and even with his leadership we might still have had to mourn the death of one of our carriers. Just as we were again crossing one of the numerous torrents, we saw ahead of us a boy who was carrying a basket on his back thrown down by the current, and dragged towards the neighbouring cataract. All his endeavours to relieve himself from the heavy load that hindered his every movement, and to remain above water, proved in vain—he sank. At that very moment however his brother, who had already reached the opposite bank, threw himself into the stream, dived under, found his brother, being dragged down to his inevitable doom, only a few feet from the edge of the fall and with infinite exertion brought him to shore.

732. Our march to-day was just as trying as it was dangerous, and although the sun was nearing the horizon, there was nothing to be seen of Watu-Ticaba. For the last six hours we had been quickly forging ahead without halt or rest: the wildly romantic environs, the charming panoramas had made us forget a good deal about being tired. South from us rose Mt. Tambaro, which again was overtopped by the Carawaimi Range, while the path led us past the southern base of Mt. Haughetika. Amongst the lovely flora of the savannah I found a new species of *Meisneria*, the *M. glabra* Klotzsch: upon the rocks which appeared in the savannah I saw the *Cyrtopodium Andersonii* growing to a height of from 5 to 6 feet. Open savannah alternated with brush wood, wooded oases, and groups of flourishing *Mauritia* palms. As we were about climbing a forested hill, our old chief turned into a neighbouring bush whence he emerged once more in complete attire, the dagger at his side, and open umbrella in his right hand, to resume his place at the head of the procession. His son, who immediately followed the father, started blowing a peculiar melody on his bone flute, the most certain sign that we were drawing near to the settlement. We had not yet reached the top when a tall ghost-like gaunt black figure with short snow-white woolly hair came walking briskly over it in our direction, and without deigning to give us a look greeted the chieftain Wayapari and then fell into place immediately behind him. From the summit

of the hill we saw the settlement extending along the edge of a great oasis between picturesque masses of granite. Signs of activity developed in between the rocks and houses as soon as we were noticed from there.

733. With open umbrella, Wayapari stalked over to the assembled groups, towards a big building, the strangers' house, where he sat upon a stool and in a long speech bade us welcome, the gray negro standing behind him the while as straight as a candle and without a movement in him. When he had finished, the eldest men of the settlement commenced to expound their eloquence. The women, as usual, stood at a distance from the strangers' house.

734. Though I understood practically nothing of this endless oration, I nevertheless had to listen to it quietly, and varied the monotony by letting my eyes wander around the crowd. The intensely gaunt figure of the negro which looked all the more ghost-like by being clothed only in a linen apron, his short snow-white hair, and large excessively prominent ears, all combined to give me a sufficiency of material for the most lively reflections, until, on conclusion of the ceremonial speech, I was convinced within myself that the old chap was more like a mythical satyr than a son of the torrid coast of Africa.

735. Watu-Ticaba settlement consisted of five large "bee-hive" houses and 58 inhabitants. The strangers' house, the most spacious I had hitherto seen, had been most carefully cleaned and decorated with innumerable monkey, pig, deer, and turtle skulls, as well as claws of the larger birds of prey, etc. We found our luggage, that had arrived before us, already placed in position here on a sort of stand.

736. Just as my brother discovered a new governor in the chief, he did not recognise the settlement as the same one he had visited before. After the death of his old acquaintance the village had been burnt, and a new one built somewhat further towards the S.E.

737. As soon as etiquette allowed the old negro to leave his place, he came to welcome us in broken Portuguese, and at the same time to tell us his life-story. Making his escape from slavery on the Rio Negro some 40 years before, he had settled among the Wapisianas, and later on had married an Indian woman, by whom he had a son who, also taking a Wapisiana to wife, was living in one of the neighbouring settlements. The negro-type still prevailed in the son whom we saw next day, except that the skin had a lighter colour, the forehead was less receding, the lips were far from being so thick, and the hair began to curl only towards the ends. The breed of the grandfather was no longer discoverable in the slightest degree in his two children, boys of 8 and 4 years of age, whom he brought with him: they were Indians completely. How lively the old negro's recollection of the past enjoyment of a drink of spirits must have been, was evidenced by the sight alone of a glass of rum which put him into such a state of bodily excitement that he hardly brought a third of it unspilled to his lips. His hands trembled like an aspen leaf when we gave it to him, and after he had drunk what was left, he rubbed his hands, moistened with the upset contents, all over his face.

738. Watu-Ticaba lies in 2° 32′ 2″ lat. N. surrounded by lovely hills, between massive granite rocks that often in the most singular shapes

reached a height of 100 to 150 feet above the level of the ground, and which almost generally were wreathed in a dense wanton wealth of vegetation. Beautiful orchids, particularly *Cyrtopodium, Schomburgkia, Cattleya, Stanhopea, Epidendrum*, and *Bromelia, Agave* and *Gesneria* covered the fissures and depressions where any earth had collected. Giant candelabra-like *Cactus*, glutted with their pretty red smiling fruits, encircled for the most part the bases of these huge rocks. The awful barbs of the *Bromelia* prevented us from climbing many of the crags. Amongst fruit-trees the mighty *Lecythis* rendered itself conspicuous above all others by its star-like outspread root-neck, and its truly colossal trunk: its branches were overladen almost to breaking point with the large seed-cover capsules, and through fear of the possibility of falling upon the heads of those passing carelessly underneath kept them all at a respectful distance. Besides these, a number of trees of the family *Anonaceae* predominated.

739. Wayapari promised to provide us with as much as we could possibly want in the way of supplies from out of his rich and extensive provision-fields, and also to make our wishes known amongst the Indians of the western bank of the Rupununi, from whom, owing to the floods, they had been completely cut off. Amidst the flourishing produce of the plantations that especially roused our complete surprise were the pineapples with fruits of from 14 to 16 lb. weight which in spite of their size had nevertheless lost nothing of their aroma.

740. The whole female population was now kept busily occupied in fulfilling our requirements and obeying the orders of the chief: even the smallest girls had to lend a hand in the washing, cleaning and grating of the cassava roots. As already stated, the men among the Wapisianas surpass the women by far in beauty of body, but Mayori Eppong was as pretty as a May morning, and never have I seen a sweeter symmetrical figure: four and a half feet in height, the width of her foot measured 2 8-10 inches. Although barely thirteen years of age she was already the mother of a dear little girl a year or two old. The early age at which Wapisianas marry was shown by another Indian girl who already had two children although she also could hardly have been thirteen years old herself. The female sex among the Wapisianas receives a characteristic expression through several elliptical lines that are tatued around the mouth, as I have found to be also the case now and then among other tribes, but never practised to the same general extent as this one. Among their ornaments my attention was especially directed to large necklaces made of seeds that spread the sweetest perfume over the wearers: they were the seeds of a *Leguminosa*, *Myroxilon Toluifera*. On enquiring for the place where the trees grew I was told that they were to be found in large quantity a two days' journey from here. Unfortunately I could not myself confirm the statement, but as the seeds were still quite fresh, there could be but little doubt of its truth. This therefore would be a second locality for this very interesting plant, which until now is only to be found in New Granada. The Indians described it as a forest tree of quite considerable size.

741. The news of the arrival of Paranaghieris was quickly spread, and already on the day after our arrival a number of Indians from other settlements had gathered round us. Amongst them, bringing his two daughters, came a second Negro who had also escaped slavery by flight and had been received by the Wapisianas: an extraordinary variation from the hatred against the Negro which is otherwise met with amongst all remaining Indian tribes. Our visitor was a highly intelligent and able man who, in spite of his many years' intercourse with the Indians, still spoke Portuguese quite fluently, and at the same time proved to be an old acquaintance of my brother, whom he had visited at Pirara in company with his elder daughter, then a robust young maiden, but now a sickly withered woman. On asking her father the cause of the change my brother was told that it was owing to the revenge of a Macusi. His daughter, at the time of that particular visit to Pirara, possessed an expensive bead ornament which aroused the envy and desires of the Macusi, who had begged her to give him the necklace or to exchange it for something else: the girl refused both proposals but soon began to feel that he had bitterly retaliated by giving her a slow-acting poison. Since that time she had fallen away more and more, and her sickness was daily getting worse. The Wapisianas consider the Macusis to be the most dangerous poison-compounders and kanaimas: every sickness, every feeling of indisposition is ascribed to their villainy. Besides the Negro and his daughter, another who especially attracted our attention among the Indians flocking around was an aged woman, "the last of her race," a striking picture of human frailty and decay. Miaha greeted none of her tribesmen of a morning, related no heroic deeds about their parents to her listening grandchildren, because father and child had already preceded her into the grave: deer had grazed for long over the sepulchral mounds of the Amaripas, while the trembling voice and tottering steps of Miaha betrayed that one would soon have to say of this once mighty tribe, "Past and gone."

742. Considering the distance from the coast where this tribe lived, and the infrequency with which it came into contact with Europeans, its extinction must appear all the more extraordinary and one might almost assume that all these people as a race, are ordained by Providence only to live upon the earth for a limited period. The limit of their time would seem to be within rapid reach both in the Northern and Southern continents of this vast portion of the world, for in a few hundred years the white man and the Negro, who will find in it a new Fatherland, will occupy it alone and uncontested. That fearful plague smallpox will curtail the period a good deal more.

743. Miaha seemed to be about 60 years of age. Neither the grief over her tribesmen who had gone before, nor the succession of years that had passed over her had been able to bleach her long hair: with the same fulness as in her youth it still covered the now more gaunt nape and fleshless shoulders while it lent a peculiar expression to the hoary and venerable face with its markedly curved aquiline nose. The Amaripas were a fellow tribe of the Wapisianas and Atorais which the whole shape of face and skull, like that of the Jewish type, plainly indicated: they

occupied the Tuarutu Ranges, where their base is watered by the river Wapuna. Miaha still remembered quite well the white people who had come from the coast several years before: (owing to the representations of the notorious Mahanarva the Governor had, in 1811, despatched a Commission from Georgetown into the interior). At that time the tribe numbered as many fighting men as there were fingers and toes upon two men. Like the Amaripas, the Atorais or Atoryas* and Daurais have also reached the evening of their life as a people. It was barely six years ago that my brother visited both these tribes on his journey to the sources of the Essequibo, and their settlements had already disappeared. Of the former only seven individuals who lived together in one house remained: of the latter now only two grown-up people and some children. In 1837 the two tribes still reckoned 200 tribesmen. The Atorais are the only tribe in British Guiana who burn their dead and bury their ashes.

744. The Tarumas† have met with the same fate. They occupied the upper Essequibo with its tributaries the Cuyuwini and the Yuawauri. According to some mysterious legends, they appear to have formerly occupied the Rio Negro. A portion of them were there converted by the Portuguese missions, while another felt compelled on that account to shift their old quarters to follow the banks of the rivers which arise in the Sierra Acarai and settle at the sources of the Essequibo. Among those that were converted, who stayed behind on the Rio Negro, death raged so violently that they soon died out, on which account von Martius, to whom the other portion of the tribe remained unknown, regarded the Tarumas as already extinct. The first intimation that a foreign Indian tribe had settled at the sources of the Essequibo on the banks of the Cuyuwini, was brought to the Colony by Mahanarva, the notorious cacique of the Caribs. His accounts of these hitherto unknown Indians were so fabulous and extraordinary as to arouse the most universal interest. According to him the Taruma must be more amphibian than human, because they lived in caves under the water and avoided the neighbourhood of any man. My brother in the year 1837 was the first European to visit this tribe, and to discover their settlements, in which the women especially distinguished themselves by their ugliness and their indescribable filth. With the exception of a smaller head, they entirely corresponded in physical conformation with remaining tribes of Indians, but they varied all the more from them not only in language but especially in the pronunciation of words. The Tarumas are held in high repute among the tribes of the interior for the excellent training of their hunting dogs. Their apron belts and graters are also celebrated.

745. A third neighbouring tribe of the Wapisianas are the Woyawais: they extend as far as the tributaries of the Amazon stream. This tribe particularly traps the *Harpyia destructor* for its ostrich-like feathers, and, its members being known as skilful hunters, must contribute in very large measure to the decrease of this beautiful bird which previously occupied the basin of the Essequibo in large numbers.

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* The Atorais are practically merged with the Wapisianas now. (Ed.)

† The Tarumas still exist as a separate tribe but are following the lead of the Atorais. (Ed.)

746 On the third day after our arrival, the population of Watu-Ticaba was increased by one young citizen of the world. The mother, with her first-born in her arms, had been in our house a short while before, and hardly half an hour later appeared at her own quarters, that immediately adjoined the strangers' house, with her new baby to which she had given birth in the neighbouring brushwood without any outside assistance. Here she sat herself on the ground with the infant in her lap, and waited until her husband had fixed up a small palm-leaf partition. After two women had lighted a fire for her and placed some drinking vessels with water close by, the remaining female portion of the population kept away from her as far as possible, because for some days to come she was considered "unclean." On completion of the compartment the husband hung his own as well as his wife's hammock up in it, and both parents prepared for the lying-in, like the Macusis. The child was small, the head already covered with thick hair: the nostrils were uncommonly thick and the nails well formed.

747. The aversion to the flesh of the European pig was never previously brought into such sharp prominence by any tribe as it was by the Wapisianas. The most conscientious Jew could not cherish a greater horror of it than did these people. One old Wapisiana, both of whose boys accompanied us from Torong-Yauwise to Roraima, only allowed them to go on the solemn promise that we would never give them swine-flesh or any food prepared by our cook on account of the possibility of the unclean flesh being cooked in one of the pots. So also in Watu-Ticaba the indisposition of a little girl whom our cook Adams had helped carry wood and water, only gave rise to the opinion that he had supplied the child with salt pork.

748. Among the numerous tamed animals that I found in Watu-Ticaba, I got a particularly good lot of amusement out of a pepper-eater, *Rhamphastos erythrorhynchus*, that had risen to be ruler with unlimited powers not only over all the feathered creatures gathered there, but even over the larger four-footed ones, and whose iron sway they all, great and small, willingly obeyed. If any contention arose between the tame trumpet-birds, hokko-hens, yakus and other fowls, they all immediately dispersed if only the powerful tyrant let himself be seen: even granted that if in the heat of the altercation he came up unnoticed, a few painful bites with his ugly beak taught the contending parties that their sovereign would stand no strife among his subjects. If we threw bread or bones amongst the thickest of the domesticated crowds, none of his two or four-footed subordinates would dare pick up even the smallest morsel before his lordship had sought out what he considered necessary for himself. Indeed his thirst for power and tyranny reached such a pitch that he set at nought all international rights, and let every strange dog that might be accompanying the neighbouring Indians who were anxious to pay us a visit, feel without pity what the law in his kingdom really was by biting and hunting it all round the village. The tormented subjects nevertheless were to be freed from this despotic exercise of power the day before my de-

parture. A big dog had arrived with its master that very morning, and believing that it had just as much right as the covetous and ambitious toucan to the many bones that Adams was throwing out in front of the house, quietly took possession of them without first waiting to see whether this would prove agreeable to the bird sitting close by. Hardly had the latter noticed this than it angrily sprang upon the impudent fellow and pecked it a few times in the head. The chastised dog commenced to growl, but My Lord, not to be frightened at this, mercilessly continued digging away with its clumsy beak, until the latter, suddenly turning its head round, snapped at the enraged bird and bit it so badly as to cause death soon after. We were uncommonly sorry because it was really more than ridiculous to see how the little chap was not to be frightened by even the biggest dog or how energetically it caused some other small disobedient knave to retire. Amongst such delinquents special mention must be made of a rodent, *Nasua socialis,* called Quasi or Kibihi by the Indians, which was so tame that it followed its mistress's every step like a dog. It lives in small communities and defends itself bravely against every attack. When it runs the tail is carried upright. When climbing up trees for birds' nests, larvae, etc., it uses the forefeet only: descending them, which is always done head first, it uses the hind ones only. Eating is just the same as with squirrels: the nose is in continual movement, and everything thrown to the animal is first of all "poked" with it. In rooting up the ground for larvae, etc., it uses this and the forefeet at the same time. When there is nothing doing in the way of satisfying its inside, it very generally whiles away the tedium of existence by taking its tail between the forefeet and then rubbing and scratching it. It is one of the liveliest of animals but unfortunately owing to its disagreeable stench makes an equally unpleasant companion for the house. Our Macusis told me that on the Mazaruni there is found a completely black and larger species, the tail of which is ringed with white. The geographical distribution of *Nasua* seems to extend over the whole of Guiana and a considerable portion of South America.

749. Although I did not wish to hand over my collections again to strange hands in view of the bitter experiences that I had had to endure, and would not now abandon them, the absolute want of means rendered it at the same time impossible to let them be carried by Indians over a piece of country that in all probability consisted of almost uninterrupted mountain-ranges. I was consequently once more forced to part company from my brother and let him undertake his journey to the sources of the Corentyne with Mr. Goodall alone. Mr. Fryer and I had to return to Pirara to fetch the living plants, especially a comprehensive collection of palms and orchids that we had left behind there, as well as the meteorological and astronomical instruments which my brother had likewise been unable to take with him.

750. According to our reckoning, the coloured people whom, on the last occasion they had come to Pirara, we had instructed to return by the beginning of June to take us down the dangerous Essequibo, must also now have arrived at Wai-ipukari Inlet. However painful the separa-

tion might again prove on this occasion, because quite unknown country still lay before me, stern necessity and concern for the collections demanded it. The 21st May was fixed upon for our departure: owing to the continued high level of the water my brother was prevented leaving the village until the 2nd June. The meteorological observations taken during this period gave the following results:

Time.	Instruments.	Forenoon.		Midday.	Afternoon	
		6 a.m.	9 a.m.		3 p.m.	6 p.m.
From 17th May to 2nd June.	Barometer ...	Inches 29·369	Inches 29·416	Inches 29·417	Inches 29·364	Inches 29·358
	Attached Thermometer	Degrees 74·64	Degrees 77·49	Degrees 83·47	Degrees 84·06	Degrees 79·43
	Dry Bulb Thermometer	74·80	77·36	82·69	83·55	79·08
	Wet Bulb Thermometer	73·41	75·54	79·41	78·94	76·40

751. The highest reading of the thermometer was, in the shade, 85.1°, the lowest 72°. The blackened bulb, exposed to the sun, rose on 21st May at 11.30 a.m. up to 125°, the one not blackened to 113°, and the moist one to 93°. As compared with a relative humidity of 68 at Pirara, the relative humidity here was 73. From the 18th to the 27th May the wind blew steadily from the North, and then shifted over to an E. by N. and N. by E. direction.

752. My brother fixed the position of Watu-Ticaba after 30 meridian observations of *alpha* and *gamma* of the Great Bear and *alpha* of the Cross at 2° 32′ 2″ lat. N. and 58° 59′ 58″ long. W.

753. On the 21st May, Mr. Fryer, myself, and some of the Macusis,—the remainder were accompanying my brother—left friendly Watu-Ticaba after an uneasy farewell: equally as great dangers awaited them as us—it might easily be a good-bye for life. In drenching rain we took the heavy road back to the landing-stage on the Awarra, where we found the boats, as well as the things stacked there, in exactly the same state as when we left them. In the meantime the water had fallen considerably and the strong current took us quickly back to the Rupununi, and down its stream which was also once more limited by its banks. We got over Cuta-tarua Fall successfully, but searched in vain its highest crag for the mighty tree-trunk. The flood had reached right up to it, and carried it away. How extensive must the overflooded savannahs have been at this time! I found my ant-bear a finely prepared skeleton, but unfortunately missed certain of the bones which some insatiable carrion crow may have flown away with.

754. By the 23rd May we had already reached Kuiaraton settlement and as on the occasion of my previous visit I had noticed a fine tame monkey there, I again tried to buy it. The house in which we had

found the small-pox patient was closed and the entrance stopped up with palm-leaves: the sick man had succumbed to the scourge and with the exception of a few whom we found engaged in preparing Caraveru paint, the inhabitants had left the village. Amongst the aborigines of Guiana it is exclusively the Wapisianas, Tarumas and Macusis who engage in the manufacture of this pigment from out of the leaves of *Bignonia chica*: it has already found its way to North America, where it is used for colouring cotton red and yellow, and for adulterating cochineal. The leaves of the beautiful creeper are somewhat dried in the shade beforehand and then thrown into a large trough or pot full of water, where it becomes completely fermented by the second or third day, as a consequence of which the red colouring material at the same time settles down as a fine powder. When this process is completed, the sediment is washed until such time as all the foreign particles are removed, when it is exposed in the sun to dry and then packed in little boxes made of palm-leaves. The Indian uses this fine colouring matter only as a face-paint for which purpose it is mixed with sweetly-perfumed resin.

755. We could not do any business with the monkey because the owner wanted a gun for it. When I let him see my surprise at being asked this enormous amount he explained that the whole settlement wanted a gun because the only one they possessed was useless. Had they by chance wanted a couple of fish-hooks, I would have obtained the object of my desires at that price.

756. At midday on the 24th we reached Aripai settlement, where the villagers bought us such a lot of pine-apples that we could have freighted a corial with them when the young Portuguese woman at the same time asked us to take her to Waraputa. There being already several Portuguese from Fort Sao Joaquim living there, she wanted to go and join them, because in Aripai she did not feel any too safe. We readily acceded to her wishes and with her goods and chattels, consisting of two worn-out blue dresses, she was soon in our corial.

757. As on coming up the river I had noticed at Curua several young seedlings of the glorious *Attalea speciosa* (sect. 667) I landed here to plant them in a box and take them with me to Berlin. The same thing that had happened with my ant-bear took place with the kaiman that I had left behind here, close by: I found a well-prepared skeleton, but some of the vertebrae were missing. On the following morning we were already heading into the mouth of the Awaricuru which, in consequence of its rise of level and in connection with the Quatata, presented a grand waterway to the immediate neighbourhood of Pirara. Swift as an arrow we shot down between the banks of the Rupununi with the result that whereas ten days were required to go up the stream, it took us four to come down.

758. At Pirara, which we reached towards evening, we found everything just as it used to be. Levingston was likewise still there, trying to rake in, by fair means or foul, every bit of money that was to be found among the Indians, so as to bring at least some salvage from the shipwreck of his speculative hopes back to Georgetown. As a matter

of fact, this smart trader had not even been ashamed to coax out of the little girls their neck-chains with the bits of money still attached in exchange for big metallic buttons which, on account of their brilliancy, struck the eye more than the quarter-and half-dollar pieces: they had not the slightest inkling that for but a single silver coin of theirs they could buy in Georgetown, not one, but from 12 to 16 similar buttons. This dirty greed for gain irritated us so much that we could not resist reproaching him, and showing the villagers how they were being swindled. The poor unfortunate fellow was indeed to be pitied, but that gave him no right to cheat ignorant Indians. It almost seemed however as if every unlucky star had lighted the way for him when he took his leave, because even a later speculation failed him on our return. On my brother getting back to Pirara from town he brought the news that the dogs, both there as well as on the lower Essequibo, were suffering from a terrible epidemic, to which the greatest number of them had already succumbed, so that an animal was a rare thing and fetched a huge price. This information awakened new hopes in Levingston, who without further ado hastened to buy up all the curs in the neighbourhood and take them to Georgetown. The dogs which had accompanied my brother had become the objects of general admiration in the capital, where even 80 dollars had been offered him for the faithful Tewanau: he nevertheless could not make up his mind to sell the beautiful creature, and without the slightest sign of its having been attacked by the disease, brought it back with him to Pirara. Levingston started buying up dogs with an ardour peculiar to the speculative trader and we were already congratulating ourselves that ours, of which I was anxious to take several to Europe, had escaped the plague, when to our regret it broke out amongst them with a violent cough. Kaibra was the first to succumb: then came Tewanau and Levingston's pack of hounds which by the time we returned to Pirara had dwindled down to a miserable remnant. On dissection we found the disease to be a pulmonary complaint. The lobes of both lungs were swollen and in an advanced stage of decomposition: all pulmonary vessels without blood.

759. Some days after our return, news was brought us that the Brazilian Boundary Commission had arrived at the mouth of the Pirara, where they had pitched their camp, in order to commence the mapping of the probable Brazilian boundary. This information was soon followed by a visit from Colonel de Matoz of the Engineer Corps, leader of the expedition. The Colonel was a man with white hair, well advanced in years, who evidently no longer possessed the strength necessary for such a difficult undertaking. On his very first visit he employed every means he could to learn from us the geographical position of the points that my brother had noted were boundary marks of the line claimed by England. Though he tried on the first occasion to hide his intentions as much as possible—for this information would certainly have saved him carrying out the most important and at the same time the most difficult part of his duties—he nevertheless made quite open profession of them on the following visits, with which he almost daily honoured us. What use he made of what we told him I do not know:

he certainly did not receive correct information, and had he based his map upon our diplomatic perfidy, an extraordinary boundary line would have been the result. Colonel de Matoz could not commence mapping for the present, because he was still awaiting another engineer officer: but how this map was ever to be made remained an intricate puzzle to Mr. Fryer and myself, because, in the belief that neither astronomical instruments nor sextant were necessary, these two gentlemen had brought none with them. Our statements remained consequently the only basis for fixing the boundary.

760. When in the course of conversation we came to talk about the "trade" with which the Indians have always to be paid when their assistance is required, the Colonel assured us that as this was unnecessary he had brought none: the Indians had to render him the help demanded without any recompense, a statement that showed clearly enough that I knew as little of the relations existing between the aboriginals and the authorities on the Brazilian side, as Colonel de Matoz of the Indians under free or English government. The whole undertaking bore the greatest resemblance to a Don Quixottiade. While the presence of the Boundary Commission proved the source of many a cheerful hour to us, it was the cause of the most abject terror for our absconding Portuguese friend because she was continually afraid of being discovered by members of the Colonel's party when they were rambling around. Fortunately she escaped the detection she so feared, by hiding during the day in the thickest spots of the wooded oases, and only returning to the village at nightfall. A second source of amusement was the fruitless attempts of the Colonel to make rebels of our valiant old one-eyed chieftain Basiko and his subordinates. However often the Colonel might invite the latter, together with the oldest men from his village Umata, to his own camp, treat them there in such splendid style, and on each occasion shew Basiko the beautiful gold and silver spangled uniform and polished sword that he had brought and promised him as reward if he and his subordinates would only recognise allegiance to the Brazilian Government, it had no effect although it was an inducement very often practised by the Brazilians with success. The many outrages of which Basiko had been witness, the terrible oppression to which his tribe had been subjected by the Brazilians, together with the threat of Majors Coelho and Leal to hang him like a dog, had so impressed themselves on his memory that glittering gold and coloured cloth could never efface them. Basiko remained true, and Colonel de Matoz must have noticed with annoyance that on our departure from Pirara, he accompanied us in excellent spirits to Georgetown where, as a reward for his many services, he would receive, at the hands of the Governor, if not a uniform decorated with gold and silver, at least a beautifully ornamented chieftain's staff, and a large printed patent of office, upon which the Indians set an uncommonly high value.

761. On getting back to Pirara we did not find the coloured captains we had expected but they came on the 7th June, when we started busily to work transporting the baggage to the landing-stage of Quatata now only 1,000 yards away. On the 18th this was completed

and the Indians, under Basiko's orders, who were to accompany us to Georgetown as paddlers, were ready to leave. From out of the remnants of our larder we were able to give Colonel de Matoz a splendid farewell dinner, which on account of a few bottles of wine, assumed a cheerful character because his disappointment over the ill-success of his efforts was soon washed away, and with the assurance of his never-to-be-forgotten friendship we helped him, late at night, on to one of our friend Youd's horses. These animals, in the absence of their owner, continued to exercise their limbs around the environs of the village and were the only living creatures that had not forsaken Pirara which they still seemed to regard as their centre of attraction. Sad to relate, as we heard before we left next morning, the Colonel had not been able to stick on his saddle but had fallen off and sprained his arm.

762. Towards midday on the 11th June I came out of my house for the last time, never to return to the simple palm-thatched roof under which I had spent such monotonous, such bitter days, yet also so many happy and cheerful hours: a home that had sheltered both myself and my collections, my only riches, for months at a time from the torrential rains of a tropical winter, and had provided me with every convenience that a contented mind could possibly wish for. To me it was like parting from an old and faithful friend. I was overwhelmed with other feelings however on making my way over to the charred ruins of the mission house. How often, within those blackened walls had I listened to the teaching of our zealous friend now mouldering in the grave, how often had his infinite patience and noble self-sacrifice aroused my admiration! The Sower had been called, the Seed trampled upon and destroyed, and the House where it had been sown become a gloomy ruin, the site of which in the course of a few months might be sought for in vain. These melancholy sensations became too painful at sight of the village rapidly hurrying, dreary and desolate, to absolute decay. Deserted by all its residents, a large proportion of the houses already tumbled down, and those still upstanding surrounded with a wanton increase of weed and bush, and the wide streets once more surrendered to the absolute sway of rank vegetable growth, the last vestige of Life bade farewell with us to the spot that once had been so full of it, that but a year ago had still raised in everybody such glorious hopes, that was doomed to utter ruin by the death of the one man whose energies had called its prosperity into being. The large wooden cross which the Brazilians had set up when they took possession of Pirara stood yet in front of the burnt-down church, and was to me a symbol of the hope that perhaps there soon would dawn another day that might prove more favourable for the Indian tribes, now forsaken and left to their own devices.

763. We tarried awhile on the last hill that overlooked Pirara: it was hard to say good-bye: it was the last look that I cast upon the sombre ruins, which, from in between the vigorous vegetative growth, from in between the thousands upon tens of thousands of smiling products of continually creative Nature, appeared still more gloomy. I then hastened on to the Quatata where our boats were lying, so as to

travel by way of the Awaricuru to Wai-ipukari Inlet: the baggage had to be properly packed here. Our squadron consisted of 8 vessels and 50 Indians. Besides the corial in which the coloured men had travelled up from the coast, the number of packages necessitated our purchasing from Captain Leal yet another large Brazilian craft (Igarité), lately returned from a business trip to Georgetown that was still lying in the Inlet just mentioned. It was to this boat that I entrusted my boxes with palms, of which several had already reached a good size, as was also the case with the orchids. The packing was completed within a couple of days, when a livelier, more painful farewell awaited me. All our Indian friends from far and near, were once more gathered here to see us and shout their "Tombawai!" I am not ashamed to admit that I was deeply affected, and could hardly restrain my tears when aged and young, old men and boys, pressed around to shake hands for the last, when the mothers held up their babes with their little hands in front of me, and implored me to stay. This honest sign of the love of Nature's innocent children was my rich reward for so many troubles and sufferings, for so many misconceptions, and as I can yet still call to mind, for so many illusions. Civilisation possesses infinitely higher qualities than those which these children of Nature possess, but it lacks that clean morality which is generally found amongst those Indians who have not yet come into contact with the European, and accordingly have not yet been polluted with his vices. I found peace, happiness and tranquility quite natural with them: and just as natural the simple love of husband for wife, of parents for their children, of children for their elders. I also recognised plain honest friendship, and unlimited gratitude, which was certainly not expressed in empty words to die away, but to be preserved in the faithful keeping of their hearts. It is not necessary for the civilised world to teach them morality and virtue first: Indians do not speak about these things but practise them: their words are acts: their promises are deeds.

764. Though our little flotilla had already rounded a bend of the Rupununi that blocked the figures with their outstretched arms from view, we still continued to hear the loud "Tombawai!" of those who had assembled there.

765. The strong current brought us by about 8 o'clock in the evening to the Macusi settlement Haiowa which on the journey up was so flourishing and populous: it was once more abandoned and overgrown with weeds. The sudden death of the chief and his wife, as well as that of several victims of smallpox had driven away the residents. Two Carib families had taken possession of the desolate houses. Next day we found both the settlements in the neighbourhood of Rupununi mouth in the same neglected and overgrown condition, and heartily did I welcome the broad sheet of water of the Essequibo which on the third day again received us. In going up stream it had taken us eight days to cover this distance.

766. On the left bank of the Essequibo some miles from the junction with its tributary, and in the neighbourhood of the big Cumakiya Kirahagh we searched for the site of a former Dutch Post that had been

pushed forward as far as here, but only a somewhat low brush-wood and a few *Cecropia* trees now indicated it. This Post had been advanced so far south to prevent the slave-raids, mostly directed against the Macusis and Wapisianas carried on by the Caribs who in previous times thickly populated these lands along the Essequibo and Rupununi. According to Alexander von Humboldt this Dutch Post on the upper Essequibo had already been mentioned by Don Antonio Santos in the account of his travels in the year 1775.* This Post, however, only fulfilled its mission for a short while, because the Caribs subsequently discovered a means of circumventing it: they picked a way along Primoss Creek to the Corentyne. The Dutch accordingly let the Post go to ruin. The many extensive Kirahaghs (Inlets) on the Essequibo in the neighbourhood of Rupununi mouth are surprising. Besides the Cumakiya Inlet already mentioned, another one, the Masaetayourou, is to be found on the same bank about 12 miles above it: and yet again, some four miles farther up is the Primoss Inlet cutting into the right bank of the Essequibo. In earlier days when this part of the country was thickly populated with Caribs the much frequented path led from here to the Corentyn. My brother, who visited the spot on his first journey up the river obtained practical proof of this: at least, the frequently-recurring spots of less dense vegetation overgrown with *Cecropia* on both banks of the Essequibo indicated that settlements must once upon a time have flourished here. In such spots he even discovered cacao and lemon trees which clearly enough shewed that the earlier inhabitants had occupied the lands as far up as here.

767. I hardly recognised the Essequibo again. Islands, rocky boulders, everything was covered with a mass of billows rolling wildly along, above which, here and there, were to be seen thick foliage trees and bushes as they swayed to and fro, and indicated the position of former islands. We soon reached the large inlet Aruan or Tokutu on the left bank, and with it the mouth of the Rappu and Rappu cataracts, which also were fairly covered with water, and yet where one of our corials that contained the most valuable astronomical instruments was very nearly smashed to pieces. The sharp eyes of the captain missed one of the rocks covered with foam: the corial grazed up against it, began to turn, and it is a wonder to me even to-day why it didn't shoot broadside on down the fall.

768. With the Rappu Falls commenced the period of danger when we were hourly threatened with sudden death, for the whole series of cataracts that we had surmounted at so much risk now lay downstream, and had to be shot over when meeting with them again in that labyrinth of islands which is so characteristic of the Essequibo, and especially of the larger streams of British Guiana.

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* On his first journey up the Essequibo my brother had been assured by the Indians that their fathers had spoken about this Post, at the same time quoting the evidence that the brother of Mahanarva, the great cazique, had removed the two cannon to his own settlement further south. As was mentioned to my brother by Irai-i, Mahanarva's nephew, who happened to be in his employ, one of the cannon is still to be found there, the other having been sunk. Cf. R. Schomburgk : *Reisen in Guiana und am Orinoko.* p. 121.

769. We got over the Achramucra as successfully as we did the Rappu Falls, although the volume of water forced its way through the granite barriers with such power and rapidity that we flew through the turbulent eddy to the foot of the cataract like an arrow shot from its string. We also passed without accident the Falls of Curutoka or Orotoko, as well as those of Ouropocari, although they presented to the eye nothing but a white mass of foam. The largest boat, which was occupied by Mr. Fryer and myself, always led the way for the little squadron and accordingly was the first to shoot falls, so as to be ready with immediate help in case of accident, I being then always in a position to watch the boats behind making their way down. Certainly there were moments that I passed with bated breath and contracted chest. As quick as thought the boat appears at the summit of the fall or rapid, and the next instant it is already hidden in the foaming cauldron which the devilishly excited wild unfettered billows form at the bottom. It is then suddenly tossed up from here as if no lighter than a feather and, while still shivering in its very timbers, glides smoothly onwards through the waves beyond the reach of the troubled waters. Once safely on the smooth, all hands are busy bailing out the water that has been taken in, and prevent the vessel sinking. I must admit that the very sight of it had something more alarming and terrorising in it for me, than shooting down in such a boat myself because owing to its taking place so rapidly one cannot realise the risk that is run. The most awful moment for me was always when, the boat being dragged to the summit with momentarily increasing rapidity, we had to rest our hands in our laps, and without daring to touch even a board or any other object in the corial, submit our will entirely to the might of an irresistible power. The slightest jerk of the hand might upset the balance of the boat when everyone must already give himself up for lost: once it has reached the summit, there is but an instant to choose between life and death. The watery billows at the foot of the fall restore the bated breath, and show that the dangerous leap is over, while the contracted chest expands in the consciousness of life being preserved by keeping absolutely still.

770. Many of the larger and smaller rapids that caused us when on the way up so much sweat and sorrow were hardly noticeable and could be passed without danger, while the continually pouring rain made those that were visible still less dangerous, as I had expected, because the waters of the Essequibo were rising hourly.

771. After passing Tambicabo Island and the mouth of the Siparuni or Red River, the Essequibo as a consequence took on a more reddish tinge. Owing to the colouration of its chief tributaries between the Rupununi and the mouth of the Essequibo in the Atlantic Ocean, the waters of this section of the main stream show changes of colour no less than four times, although this is less striking in the wet season owing to the quantity of detritus that all the affluents bring along with them, than it is in the dry. The Rupununi gives the hitherto rather greenish-blue waves a whitish-yellow appearance which, owing to the

waters of the Siparuni, passes into a red: below the mouth of the Potaro or Black river, this is changed to a dirty brown, to be restored again to its original colour by the Mazaruni.

772. Past the mouth of the Ortuahar and the Curibiru and Cuyari-waka Cataracts, we made like lightning for the Twasinki Range, with its two remarkable granite columns, that soon lay behind. In front of us, however, there blustered and foamed the dangerous falls of Itababo, Akaiwanna, Itamine, and the most perilous of the whole series, the great Yucurit or Cumaka-toto, which we were fortunately able to avoid by means of a small side-channel down which however we had to streak the boat with a rope. Owing to its having sprung a considerable leak in shooting down, our big Portuguese craft which contained my collection of living plants was exposed to grave risk at the very foot of the awful Twasinki Falls: it was only saved from sinking by the huge current that drove it onto a small, yet visible island, where the unloading of the plant-boxes and the repairs to the vessel forced us to spend the night. The *Myletes Pacu* had collected in large quantities in between the granite boulders at the bottom of the Fall, and supplied us with a tasty supper.

773. Next morning we had to pass the most dangerous fall of the whole series, that of Haiowa, the perpendicular height of which, in spite of the unusually raised surface of the water, still amounted to over 10 feet. I must admit that it was with a certain anxious and oppressive feeling that all of us approached this damnable spot which already from a considerable distance off was thundering out its dull and angry roar, that every second became louder and louder. In front of us we saw the waters rushing headlong over the summit, and on yonder side of it, splashing up into clouds of foam: one's breath stopped: the corial was now drawn with irresistible force and buried deeply in the unfettered billows of the caldron, whence its bows emerged like a bold diver out of the stormy waves—the danger was passed. The remaining craft were as fortunate as ourselves in ploughing their way over the whirlpool. It was with lighter hearts when, over on the other side, we bailed the boats of the water that they had been loth to take in. The small rapids remaining were also passed without further accident.

774. In the midst of this almost continual mental excitement we had now got close to Waraputa Mission. We had already learned from the coloured men that the lonely little community had obtained a new shepherd in a Mr. Pollitt,* who with his wife and sister-in-law had come to Waraputa some six weeks before. Our almost 19-month long tour with the untutored Indians had not allowed us, however, to run so wild as not to feel that in such a costume as now covered our mortal limbs we could not appear before ladies who had only just left the refinements of the capital and could certainly not be accustomed to the informal condition of clothes that were fast going to rack and ruin. In order to complete the latter with the sorry remnants from out of the once well-

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* Wrongly spelt Pollert in the text (Ed.)

supplied contents of the trunk, we landed at a small island and started on the difficult metamorphosis. While thus engaged I was startlingly interrupted out of my attempts at beautifying myself by the shouting of an Indian who had noticed, immediately above my head upon one of the branches of the low tree under which I stood, a large coiled-up snake that was keenly watching my movements with its glossy eyes. A shot with the gun brought it down. It was the first occasion I had seen the snake, and in its broad cordiform scaly head and the thin sharply marked-off neck believed I surely recognised one of the most poisonous of the kind, as was likewise confirmed by the accounts of the Indians. It was a surprise to me that it had its fangs, not in the upper jaw, but in the lower, and that, as was subsequently discovered in Berlin, they are not hollow: it was *Xiphosoma hortulanum* Wagl. On my journey up the Pomeroon, I also came across some specimens, but always on bushes. Green branches must accordingly be their favourite resort. In spirits, the beautiful light grey colouring—with the irregular brown specks which extend from head to tail, and when held to the light pass into a pretty light blue and green,—loses much of its brilliancy.

775. Some Indians who were fishing, as well as the loud reports of our two mortars, gave notice of our coming to the Waraputa villagers, who had collected at the landing-place, where Mr. Pollitt, a young man, received us most cordially, and his wife and sister-in-law, a young lady 18 years of age, extended us an equally hearty welcome: they took us up to the Mission House where the clergyman's two children were. A peculiar sensation overcame me as I suddenly found myself mixing with civilised people again.

776. That Mr. Pollitt had pictured his stay among the Indians of Guiana as very different from what he had already found it within so short a time, was evident to me not only from the elegant furniture which would have been no disgrace to the most fashionable drawing-room in Georgetown,—even the stylish riding-saddle which, before I entered the room, had forced from me an inward smile, had not been forgotten—but particularly from the truly unfortunate state of mind in which the poor woman and her sister found themselves. How romantically, how picturesquely idyllic must these ladies have painted their residence among the children of Nature, and how bitter must the awakening have been, when they now stepped into the modest, but to a Londoner, miserable hovel which the brave-hearted Youd had looked upon as a palace. We had hardly been in their company a few hours before their cramped-up mental excitement burst into a flood of tears, and both unburdened their more than heavy hearts. In so many months, how few the tears that I had seen: they accordingly aroused my interest all the more, and with inward sympathy I gazed upon the poor woman, between her sobs, pressing to her breast her children—a boy of five years of age and another of one—and assuring them that they would soon be orphans if they were to live any longer among these awful people. The words found the truest echo in her sister. Most of all I had to pity the poor missionary, whose sense of duty had come into such hard conflict with love for his wife, who now implored and then urged him to forward his resignation to

Georgetown through us: she was still more pressing next day when her sister declared that she would accompany us to Georgetown, as she could not live here another week, a determination from which the entreaties of the wife and brother-in-law were unable to restrain her.

777. So firmly did Mr. Pollitt refuse to grant all his wife's prayers, so convinced was he that he was following his true vocation, and that he must sacrifice everything for it, that it required another three months for her to prevail upon him to apply for his recall—continuous sickness prevented the fulfilment of his noble and onerous duties. The news came to me as a surprise, because I had left Mr. Pollitt, still imbued with fiery zeal, and because he had been granted everything he could possibly wish for, including the wherewithal not only to build a new church but also a new mission house, for which object he was daily expecting workmen from Georgetown. The bright colours in which he had painted the future of Waraputa, the ardour with which he spoke of the plans and arrangements for the welfare of his wards were unfortunately soon obliterated. I have never again got to know men like Youd, or women like his wife who, practically without any help at all, have gone into the interior of Guiana, where, supported and fortified by high and beautiful ideals they have been willing to suffer all the troubles, hardships and privations of which the modern missionary cannot have an inkling.

778. The Brazilian deserters had all settled down to domestic life at Waraputa, happy and satisfied with the change from their native home. Our latest absconder was received with open arms by her land's people.

779. With her figure wasted to a shadow, and affected with profound melancholy, the sight of another acquaintance of ours made us feel all the more depressed. Baru, the happiest, liveliest, and healthiest maiden upon whom the glances of the oldest Indians had turned with delight and whose beauty had enraptured the village youth, had fled to Waraputa to avoid the snares of her hated Aiyukante. Her heart however clung with all its might to the home where she was born: her thoughts bore her by day and her dreams carried her by night to the spot she had so strong a feeling of tenderness for, but which the horror and hatred of her obtrusive suitor, and the fear of his revenge forced her to shun. Arrived at Waraputa home-sickness had also banished the fulness of vitality from her figure: the lovely outlines of her body had disappeared and, gaunt, emaciated, with one foot already in the grave, she put out her wasted hand with a deeply pained and weary smile. "Aiyukante has done this," said in a hollow voice, were the first words she used, and had not Mr. Youd already explained to us that almost every savannah Indian when he leaves his home and exchanges it for the damp forests succumbs to the change of climate, we also should have ascribed the alteration in Baru as due to Aiyukante's revenge. The hollow disquieting cough which interrupted her almost every word indicated clearly enough that the mischief in her lungs had entered on its last stage. (Sect. 274.)

780. After a two days' stay we left Waraputa in company with the young lady for whose comfort we provided everything we possibly could. The parting of the two sisters was hard.

781. Without mishap, we successfully manoeuvred the extensive series of Waraputa Cataracts and after passing the Akramalalli, Cumaka, and Curatoka Rapids, as well as the mouths of the Potaro, Oumaia, Cumpara, Arikataro and Akuina on the left bank of the Essequibo, and of the Mariwa and Copana on its right one, we reached the Arissaro Range with furious rapidity. The river, now rarely interrupted with islands, bore us quickly along, on the right past the Dahalabani, and on the left past the Yucurisi and Baribara, both of them small streams close to one another, then by Yucurit and Monticuri Islands that reach close to the mouth of the latter, and so on to the Mucu-mucu, which forms part of the line of communication between the Demerara and Essequibo. After passing the mouth of the Curtuahara, then the islands Hubucuru and Cutuabanabo, and after these the mouths of the Tipuri and Arowawa, we reached big Gluck Island. Before us there now lay the last row, the falls of Ahara, Sassara, Itaballi, Parumallali, Mai-hi, Tabinetta, Arissaro and Aritaka, which so far as the eye could see formed nothing else but a raging and foaming volume of water. Anxious to see what effect the unfettered element and the risk with which our lives were threatened might have upon our young companion, I turned round to have a look and noticed with surprise that no pallor blanched her cheeks, not a tremor moved her lips in prospect of a sudden death, but that those blue eyes of hers calmly and fearlessly looked the danger straight in the face. It's a curious thing, the human mind.

782. We shot the foaming billows, and fortunately reached the edge of the irresistibly seething caldron, but not without our boat being filled with water near to sinking, and next day got over the last cataract, the Aritaka, with the same stroke of luck. Everyone of us shouted for gladness and joy, and gratefully thanked God Almighty for having so wonderfully and mercifully protected us. What a miracle it was that all of us had been saved!

783. Borne swiftly on the waters of the Essequibo that were now rolling smoothly along, our little squadron with its cheerily waving flags, reached the first settlements of the coloured people who, collecting along the banks as we drew near, had shouted out their welcome while we were still far off. In the afternoon we landed at Bartika Grove, where we were received with open arms by our friend Bernau and his family.

784. It was a bright and happy time we spent here, and all the brighter because we had been strangers to it for so long. On the Sunday the whole population of the neighbourhood gathered here and thronged the stelling to look at and admire us new-comers. We had done the down trip from Pirara to Bartika Grove in 13 days, a distance that had taken us six weeks on the journey up.

785. But what a change had taken place at the friendly Mission during our 19 months' absence! A new, bright and pretty church, dedicated but a few weeks before, adorned the centre of the settlement. The second building for the Indian girls was also completed, and con-

tributed a good deal to the nattiness of the Grove. And what a nice impression in their neat and cleaned-up clothes was made by the children of the forest whom we had seen for such a long time without any clothes at all, and mostly covered with dirt. By next day the boys were again bringing me some birds and snakes that they had killed in the forest near by. Amongst the latter I found the beautiful green tree-snake *Dryophis Catesbyi* Schl. which like *D. liocercus* only lives on bushes and trees. The colonists and coloured people call both species "Whip-snakes" on account of their long thin body and still thinner tail: they are both uncommonly active and "cross," *D. Catesbyi* being even believed to be poisonous. When angered they not only change their beautiful colour, but hit out all round with their thin tail, and if the unprotected skin is hit, a distinct weal is left just as if one were struck with a whip. It seems that when Stöckle got to Bartika Grove he invested the money earned by him on the expedition, in a provision shop and was just on the point of marrying a coloured widow with a little property whom he told me all about in one breadth on greeting me: the honest Swabian was proudly happy on seeing us arrive safely at the Grove.

786. The now completed Colonial Penal Settlement, the House of Correction for lawbreakers, that I have already mentioned, rose at the mouth of the Cuyuni like a desirable palace, which so long as one did not call to mind the object for which it was intended, formed a fitting ornament to a charming river landscape. Next day we visited the Institution which was under the control of an Inspector, with some subordinate officials, several warders for the surveillance of the convicts working at the quarry, as well as a surgeon. The Inspector very kindly showed us round. The buildings for the officials were especially fine and spacious: the cells for the prisoners were equally as ample and healthy. The greatest cleanliness and tidiness was everywhere the rule. The number of convicts amounted to 300 among whom I noticed but two whites: it is true they were Portuguese from Madeira: all the others were Negroes. Some of them were engaged in quarrying, others in cultivating the large forest flats upon which they would depend for support, the cost of which the Colony has still up to the present to defray. The broken stones are partly sold, and partly used for building up the streets in Georgetown. Labour is limited to nine hours per day. On working days the food consists of plantains, each person getting from 14 to 16, and salt fish: on Sundays it is rice. Artisans among the prisoners were also engaged in making a church and a building for female convicts. Mr. Bernau attended to the services. After the opening of the establishment a number of the convicts had escaped punishment by flight, which was not difficult in view of the small number of superintendents and the large number to be superintended. To overcome this evil, and not to further increase the already high expenses by appointing more officials, the whole Indian population in the neighbourhood were made guardians of the peace. With this end in view, the Inspector made use of a means whereby he incited the brown population into complying with the proposition ten times more willingly than the

offer of a five-dollar reward for every escaped Negro returned would have done. After sending for all the chiefs and oldest men of the different tribes in the neighbourhood to come and meet him on a certain day, he explained the object of the institution and what was to be expected if a number of criminals escaped their deserved punishment by running away. But as these escapees could not get away anywhere but into the forest, they would have to hang about the neighbourhood of their settlements, and would prove equally as great a menace to their provision fields as they would to their women when working them. Though the assembly had hitherto listened to the Inspector's speech in silence and with the greatest indifference, this last intimation of the danger threatening their women proved the electric shock that exercised the most powerful and visible effect upon the crowd. Growling with rage, the hitherto taciturn chiefs promised not to permit any convicts near them, but to do everything in their power to avert the danger threatening their legitimate freedom by arresting them. As soon as a convict was missed his escape would be notified to the Indians by cannon fired five times and the hoisting of a flag: three days rarely passed before the escapee was bound up and brought back. Up to now, in spite of the number of attempts previously made, not one has succeeded in escaping these watchful, jealous guardians of the law. Only one single convict had managed to hide away for nine days, when he was found by them in a provision field. The inmates are now so firmly convinced of the impossibility of making a successful escape, and of the certainty of the unpleasant welcome awaiting them in the shape of having to work in heavy chains, that they only very rarely attempt it.

787. On Nai-curipa Island, close to Bartika Grove, people were busily occupied in erecting a new Leper Hospital because the one in the Pomeroon had proved to be most unhealthy. A schooner that weekly brings provisions for the convicts from Georgetown and returns with broken stone, was loaded with our baggage, to avoid the danger to which small heavily-laden craft are always exposed at the mouth of the Essequibo and Demerara. Mr. Fryer and I also exchanged the corial for the schooner, while the Indians, with the exception of some of the youngsters whom I took with me, followed in the boats. The young lady remained with Mrs. Bernau at Bartika Grove. With blessings on the welfare of our further progress we left the friendly Mission and its noble residents and with a light heart travelled to town.

788. The nearer we got to Georgetown the more anxious was I to see what impression the harbour with its sea-going vessels, the plantations with their smoking chimneys, and the city with its large buildings, with all its hurry and bustle, would have upon the minds of the youngsters who only knew their forests and mountains. I had deceived myself: Zeno could not have shewn greater indifference. They hardly cast a glance on their strange surroundings: not a trace of surprise or astonishment was visible in their countenance or in their eyes that skimmed quietly from one object to another. Even the big steamer that carries on communication between one side of the Demerara and the other caused no outward sign of wonderment while they calmly listened to an

explanation of its working, for which one of their fellow-tribesmen, who had visited the city before, gave them the name of "Apo-neire" (Fire-paddle).

789. After an absence of 19 months, we reached Georgetown on the 19th June, where we were received by all old friends and acquaintances with the same kindly welcome, the same hearty and honest affection as at Bartika Grove. Unhappily, amongst these Mr. Bach was missing: he was laid up in town with a serious abdominal complaint. Within an hour of my arrival I hastened to his quarters, but was not allowed to see him owing to the surgeon's very strict orders that no one was to be admitted to his room: I never saw him again alive, for next morning brought me the sad news of his death.

790. Our Indians were given their promised reward, and Basiko received from the Governor the printed official patent of chieftainship over the Macusis settled within the British area, as well as the prettily carved and decorated staff of office, whereupon he, and the others, after a sincere farewell from Mr. Fryer and myself returned in one of the corials to the Rupununi.

CHAPTER XI.

Journey to the Sources of the Pomeroon—Plantation Anna Regina—Habits of Callichthys coelatus—Tapacuma—Arapiacro—Pomeroon—Kaari-mapo—Kuamuta Settlement—The Bodelschwingia and the Hyla venulosa, its Occupant—Psittacus madagascariensis—Mouth of the Sururu—Akupautari Settlement—Arraia Settlement—Traditions of the Caribs: their Habits and Customs—Cazique Mahanarva—Effects of Clibadium asperum—Cyphorhinus cantans—Return to Arraia—Strychnos toxifera on the Sururu—Hunting Crab on the Coast near the Pomeroon Mouth—Mouth of the Morocco—Morocco Mission—Calyptranthes obtusa—Warrau Dirges—Gulo allamandi—Basin of the Kamwatta, Beara, etc.—Barama—Triplaris americana—Akawai Settlement Pirisana—Carib Settlement Cariacu—Podinema Teguixin—Waini—Sandbank—Funeral Ceremony of the Arawaks, Family Rules, Marriage Rules—Nyctipithecus trivirgatus—Return to Georgetown.

791. My brother had not yet returned from his expedition. Amongst the many letters that I found waiting for me from Germany were but a few that brought me any cheerful news to raise the natural depression consequent on the commencing fever. It attacked me all of a sudden whilst packing my collections, which I was anxious to forward to Berlin by the first outgoing ship, and made me take to my bed: next to yellow fever it was the toughest dose I had ever had to bear.

792. When I had once more pulled myself together a bit, the doctors insisted upon my leaving the unhealthy city at once: their orders were gladly obeyed because I had already made up my mind, while lying sick, to go up the Pomeroon to its source and then carry out my trip to the Orinoco. The portion of my collections that did not require such strict supervision were put on board the Cleopatra, which happened to be again in port, and I made all preparations for my trip. While doing so, Stöckle quite unexpectedly entered my room one day with his broad "Grüsch Gott" (God bess you): having heard of my intentions he had come to ask me to take him on. His offer was particularly acceptable, because up till now he had always lent a helping hand in all my labours, though I was surprised at his wanting to do so. Full of astonishment as to what it was that had made him think of leaving his wife and business for so long a period and exposing himself afresh to all the ups and downs of such a journey, it appeared that he wanted a small sum of money, and as such an expedition afforded him no opportunity of spending his wages, his inventive head had quickly taken the resolution of hastening to town with the provision schooner and offering me his services. I was only too pleased to accept them, and from that moment on, Stöckle was again my amanuensis under the same conditions as before: I gave him another coloured man to assist him. The chief object of the trip was to replace as far as possible the losses that, through no

fault of my own, the first consignment of living orchids to Berlin had suffered. The necessary articles of trade were soon purchased and packed in the schooner belonging to Anna Regina, one of the largest plantations on the fertile Arabian Coast: the vessel was just then lying in the harbour and wanted to get back. A letter of introduction from Mr. Stutchbury to the estate's manager, Mr. Hughs [?Hughes], secured a most hearty reception for me. The memories of Mr. Hughes were among the most pleasant that I took with me to Europe. I found him to be not only a highly cultured but also a very honourable man and friend. In the course of my several days' stay with him, I was witness of a laughable scene that has never obliterated itself from my remembrance. A common complaint which especially affects Negro children is that of worms.* A radical cure for getting rid of them is supplied by the brown setae from the seed-covering of the *Mucuna urens* DeC., the "Cow Itch" of the Colonists. These fine elastic stinging hairs produce on the skin an intolerable itching sensation, practically almost an inflammation, but possess the excellent property of completely expelling the worms out of their hosts. The hairs are shaved off the covering and to render them innocuous are mixed and rubbed up in syrup until such time as the mass takes on the consistency of a thin electuary, when they become supple and harmless to the gums. As a matter of fact, children are usually given every three months a cupful, which is repeated on the following morning.

793. At Anna Regina I saw this medicine being distributed. I have already mentioned that the labourers on an estate are supplied with free surgical and medical attendance. One morning I noticed in the yard in front of the infirmary more than a hundred Negro children, and mothers with sucklings in their arms, standing in a circle round a fat old scolding Negress, whom I had already been told was the estate's apothecary. A large two-handled tub filled with the electuary above described, stood in front of her: in her hand she held a large spoon with which, in her own peculiar phlegmatic way, she shoved it under protest into the boys' and girls' mouths. I never saw anything more laughable than this general physicking all round. The solicitude with which the black boys and girls drew near to the dispenser and—knowing full well from previous experience the danger of the medicine and the pains which it caused if one of the hairs, not rendered pliant enough by the syrup, remained stuck in the lips, gums, or tongue—opened their mouths as wide as they possibly could to prevent this, while the Negress, not in the slightest degree mindful, continued shovelling in the spoon without respite; or when a mother forcibly and with a beating dragged up a son or daughter, who perhaps had learnt all about the frightful pains at the last distribution, to come and receive the gift,—all this combined, struck me as being so extremely comic that I did not know where to turn. Who could stop

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* This is still true. Probably 80 to 90 per cent of these children are infected with *Ascaris lumbricoides*, a somewhat smaller proportion with *Oxyuris vermicularis* and *Trichiurus trichiura*, and a still smaller proportion with *Necator americanus* and *Anchylostomum duodenale* ("hookworm"). Of the efficacy of "Cow-itch" as a vermifuge I have no knowledge. (F.G.R.)

laughing were he to see here and there a little black urchin like this, whom misfortune had really overtaken, rubbing the wounded spots amid tears and the most frightful grimaces, or watch his mate anxiously exerting himself to discover and extract from tongue or lips the hairs that caused the trouble?

794. The irrigation trenches of the estate supplied me with many interesting fish, amongst which the *Callichthys coelatus* Cuv., the Hassar or Hardback of the Colonists and coloured people, which in its habits of life varies so much from all other fish, specially attracted my attention. The fish not only builds for its spawn a complete nest out of all kinds of fibre in between the water-plants which it will defend in the bravest fashion, but guards it besides with the most active motherly care and energy against every attack until the young fry escape. The structure is a regular work of art and is very like the nest of a magpie. In April, the artist begins building the lying-in bed out of blades of grass, in between the water-plants and rushes, to which it is attached somewhat below the surface until it finally resembles a hollow ball pressed flat, the upper vaulting of which reaches to the top of the water. An opening, proportionate to the size of the mother, leads within: as soon as the fish has spawned she never leaves this, except to satisfy her hunger, until the brood slip out. Her motherly instincts indeed prove her own undoing, because at this period she can be easily caught. One takes a small basket, holds it over the opening of the easily-found nest, knocks lightly on it, and the furious fish with outspread fins that are capable of doing fair damage rushes into the basket. I sent nest, spawn, and mother in spirits to Berlin. The still waters of the coast, especially the irrigation trenches of the estates, appear to be its favourite haunts. The creature has also another peculiarity that distinguishes it from others: it takes overland trips during the dry season. When the swamps formed during the floods dry up during this portion of the year, the hassars occupying them start on their way to find fresh waters. The plates that cover the body and the stiff spines of the ventral fins qualify it for such a journey. It has been stated that they can retain some water in a skinny sack which surrounds the gills, and that by this means they can be kept moist on the passage. At times of such exodus in which the whole of the occupants of the swamp always take part collectively, the Indians and coloured people will often fill basketsfull, because the fish, under its coat of mail, shields if only a little, yet a very tasty flesh. Should the wave of emigration meet with no water the fish dig themselves into the soft muddy ground, where they remain lying in a sort of asphyxia until such time as it again collects there. From personal knowledge, they can survive quite fresh and lively for 10 hours out of water. Just as plentiful in the trenches were two other new species that I found there, and which in their way of living by no means differ from it: these were *Callichthys pictus* Müll. Trosch. and *C. exaratus* Müll. Trosch. Besides these fish, *Epicyrtus gibbosus* Müll. Trosch. and *Gymnothorax ocellatus* Spix. were caught in equally large number in the trenches.

795. The dainty *Quamoclit vulgaris* Chois. had actually taken possession of one of the abandoned estates in the neighbourhood of Anna

Regina. Anyone who knows this beautiful creeper with its brilliant red elegant blossoms, can imagine the enchanting appearance of the spot where it not only spread over the brushwood, but even climbed up the trumpet trees and covered their crowns with a network, so that even the large whitish leaves were enveloped in it. The scarlet-red blossom was visible in the far distance. If this pretty plant is not actually indigenous to Guiana, it has nevertheless already acclimatised itself along the coast.

796. After spending a few days with my charming and intellectual host, through whose kindness my supply of provisions was still further augmented, we started on our journey in company with a party of Akawais, who had just returned from Georgetown. The chieftain had bought there an umbrella which, with the proudest self-consciousness, he held over his head, probably to protect his delicate complexion from the rays of the sun. We travelled on one of the irrigation canals up to the Tapacuma Lake. Its banks were at first lined with the most flourishing sugar-cane fields, until later on we reached the as yet uncultivated portion of the estate, which the restless hand of Mr. Hughes was preparing for cultivation. A large flock of carrion-crows which, somewhat higher up, rising from the one bank as we approached, settled on the nearest trees, made me think that the gluttonous company were swarming after a carcass. A large snake, a species of *Coluber*, the "Yellow Tail" of the Colonists, was lying dead here. This reptile often reaches a length of 10 to 12 feet and after the *Boa murina* and *B. constrictor* is quite the biggest of snakes found in British Guiana: its most favourite haunt is on the sugar-plantations. Although this one may have been of the specified size, its advanced putrefaction quickly drove me out of its neighbourhood, to the delight of the expectant birds which were already showing their impatience by flapping their wings. After getting over the lock, and at the same time reaching the boundary of the estate, Tapacuma Lake received us on her waters which were covered with *Nymphaea*, broken with dead *Mauritia* palms, and alive with numerous water-fowl.

797. A letter of introduction from Mr. Hughes ensured me an extremely friendly reception from a timber-merchant, a Scotsman, who also had charge of the main lock of Tapacuma Lake. The gentleman was just then engaged in skinning a large boa-constrictor, *Boa murina*, that had attacked one of his pigs that morning, and for which it had now to pay the penalty with its life. It measured 18 feet. A few days later a second one was killed at the edge of the lake by one of the Indians fishing there. Attracted by a noise in the proximity he sneaked a bit closer and found the snake in ardent combat with a full grown water-haas. In spite of the first ball piercing its belly it dragged the spoil, round which it was coiled, towards the water: it was only the second shot that freed the captive. The snake measured 14 feet: its skeleton is to be seen in the Anatomical Museum at Berlin. Amongst the fish most numerous in Tapacuma Lake are *Acara tetramerus* Heck., *A. nassa* Heck., and *A. margarita* Heck., *Myletes hypsauchen* Müll. Trosch., *Cichla ocellaris* Bl. Schn. and *Crenicichla saxatalis* Heck., which are

all caught on the hook. The lake is a reservoir for fish to the Indians living in the environs who come here in large numbers to catch them.

798. The botanical excursions I made from here into the neighbouring sweet-smelling vanilla-scented virgin forest were amply rewarded. Besides the attractive *Cypripedium palmifolium* Lindl. the blossom of which in its structure exactly resembles *Calceolaria tricolor*, I found several new species of the family *Clusiaceae* such as *Tovomita Schomburgkiana* Klotzsch, and *Tovomita macrophylla* Klotzsch, both conspicuous through the aromatic scent of their flowers. From out of the trunk of a species of *Garcinia*, with a quantity of apple-like fruit, there oozed a yellow gum that was exactly like Gummi guttae. I discovered large quantities of the beautiful *Eperua falcata*, and *Parivoa grandiflora*, the timber most sought after by the Colonists. After a stay of eight days I continued my journey up the Tapacuma which, as I have previously mentioned, winds its way through a thick forest of the most beautiful palms *e.g.*, *Manicaria saccifera*, *Oenocarpus Bataua*, *O. Bacaba*, *Euterpe*, *Bactris*, and stately virgin forest trees the trunks of which were covered with the most varied orchids: amongst the latter the large-blossomed *Coryanthes macrantha* and *C. maculata* let their felt-like roots, which thousands of ants had chosen for a home, hang from down the branches. In the course of a few hours we paddled into the Arapiacro which, coming from the southward, joins the Tapacuma, and spent the night with a coloured man, the present owner of what was once a Dutch estate. By the following morning, August 25th, we had once more reached the Pomeroon that comes here almost straight out of the S.W., and with it, at the junction of both streams, the Mission with its small and homely church and its industrious missionary Mr. Brett. The width of the mouth of the Arapiacro amounted to 100, that of the bed of the Pomeroon to 160 yards.

799. "Pomeaco House," and its smiling garden opposite the Mission on the left bank of the Pomeroon, the sight of which had so surprised me on my return from the Barima, had been given up by its owner, Mr. Pickersgill. On account of the population of the Pomeroon continually decreasing, he had left the business a year ago to take up the management of Plantation Columbia on the Arabian Coast. Up till now he had found no purchaser for the property, which his former business manager, Mr. Blackburn, was looking after in the meantime. The beautiful little garden surrounding the dwelling-house had almost run completely wild. The former flourishing bushes of *Oleander*, *Ixora*, *Hibiscus*, *Bauhinia*, and *Jasmine*, as well as the beautiful fruit trees, everything was covered with rank scarlet-red weeds, while the green turf, with its motley coloured *Amaryllis* beds was grazed and trampled upon by the cattle that still remained.

800. After a four days' stay which in Mr. Blackburn's and Rev. Brett's pleasant company passed very quickly I made arrangements to resume my trip up the Pomeroon. My kind host (Mr. Blackburn) accompanied us in a small corial because he was afraid that without a guide we would not find our way to the nearest Carib settlement Kuamuta, where I wanted to hire some of the residents for my farther

journey: it lay several miles distant from the river in the forest and could only be reached along a confusing network of creeks. The effect of the tide was here still so marked that on setting in, the water rose 8 feet: at spring tides it rises even to 12 feet. The water, however, had no salty taste. A thick fringe of *Caladium arborescens* bordered both banks, but on the eastern this was interrupted by some settlements of coloured folk and negroes who had established themselves there and were cultivating the soil where it was only a few feet above the water-line at high tide. The dense clusters of *Cecropia* indicated the extent to which these banks must have been formerly cultivated, as was the case in the days of the Dutch. The unhealthy climate of this otherwise extraordinarily fertile yet practically swampy stretch of land still lying at pretty well on the same level as the sea, together with the miasma constantly arising from the boggy soil, which the sea-breezes cannot dispel, combine to make the Pomeroon one of the most insanitary spots to stay in. Immediately beyond the limits of tidal influences its disadvantageous effects upon man disappear. The same conditions repeat themselves on the greater number of the coastal rivers. Soon after making a start my attention was drawn to a small fish owing to its repeatedly jumping along the surface out of the water: in the course of these activities several specimens fell into our corial. It was *Xiphoramphus microlepis* Müll. Trosch. I had already on several occasions noticed little fish jumping out of the water, but without being able to convince myself whether they did it to avoid pursuit by some enemy, or whether it was done to catch insects. Towards evening we struck the mouth of the Kaari-mapo, which runs into the Pomeroon from S.E. The mouth had a breadth of 100 feet and was of considerable depth. To reach Kuamuta we had to go in here. Its banks corresponded exactly with those of its main stream: they were flat and boggy. Several miles up it is joined by the little stream Kuamuta coming here from the S.W., which we now followed along its continual windings through the dense virgin forest. The thickly interwoven branches of the trees reaching to the skies enveloped its dawdling ripples in continual shadow. Without the guidance of my friendly host I should never have found the Carib village to-day: by nightfall we had made fast our corials to the landing-stage. A small pathway led us up to a low hill on the top of which, surrounded by high trees, lay Kuamuta. The small stream, as well as the settlement, received their names from a huge clump of bambu, which the Caribs call Kuamuta, that grew immediately at the entrance to the village. I had never seen such a giant growth before. Its root-stock had the almost incredible circumference of 368 feet, and I counted 956 shoots that had reached a height of 60 feet, of which several at their bases measured 19 inches in circumference. The tops of the shoots of this giant grass bent themselves over in gracefully waving arches towards the ground, and so formed a surprisingly beautiful really fairy-like vault.

801. The village consisted of 7 houses of which three even possessed a second storey, to which a ladder led from the outside: one of the latter buildings was placed at my disposal. The greatest cleanliness and

tidiness ruled both outside and inside the houses, and a look into the open dwellings showed me the well-nourished figures of the women and girls in an absolute state of nature: they were just then busily engaged in washing their own and the men's clothing, because they were all leaving the following day, Saturday, for the Mission where they wanted to stay over for Sunday's services. Though the Indian can accustom himself so little to clothing, he would nevertheless feel ashamed of coming into church without any, be it only a shirt that he covers himself with. As soon as the church goers leave the sacred edifice, the clothes are straightway packed into the basket intended for them, where they remain until the following Friday, to be again taken out and examined to see if another wash is required: it is always the first sign of a formal Christianity. The thermometer still recorded 80° F. of an evening. Mr. Blackburn, in spite of the darkness that had set in, turned to go back home.

802. On the following morning, everybody except one sick old woman had disappeared from the settlement. But even she did not seem to be too safe with us near by, for hardly had we got out of our house than she languidly dragged herself off into the forest and only showed up when the Caribs returned, so that from Saturday to Monday we remained the only occupants of Kuamuta.

803. The hill was girdled with most luxuriant foliage trees amongst which several *Hypericeae, Amyrideae, Humiriaceae, Malpighiaceae, Mimoseae, Cordiaceae,* and *Guttiferae,* were noticeable. The collecting of twigs with blossoms from these huge trees was naturally attended with no inconsiderable difficulty, because jointly and severally they could not be climbed, and would therefore have to be cut down: a labour, however, which had its reward for me in that in most cases I recognised new genera and species. Equally as flourishing as the forest vegetation were the provision fields which stretched down the hill sides. At the foot of the hill the foliage trees had disappeared and were replaced by *Manicaria, Maximiliana,* and *Oenocarpus.* Besides the usual plants cultivated in the plantations I found also the beautiful Paripi palm, *Guilielma speciosa* Mart. which the coastal people like on account of its fruit, certainly only tasty to the Indian's palate, and therefore readily planted in their fields.

804. I have only met this rapidly growing palm [the Paripi] along the coast, never at more than 300 feet above sea-level. The fruits have a whitish fibrous almost sweetish flesh, and look nicer than they taste: with often several hundreds of these attached to the long fruit-stalk the slender palm presents a funny appearance. The Indians boil the fruit and also make a sweet drink of it.

805. However much rewarded we may have been by our stay at Kuamuta, we were on the other hand punished by the "Bêtes rouges" which, settled on every bush and grass-blade, stuck on to us and soon found their way under our clothes where they dug themselves into the soft parts and loins. Rubbing with lime-juice was the only remedy for killing these tormenting wretches. As the creature turns black when dead, our bodies received a peculiar covering. In the *Coelogenys paca* I found these parasites clotted together in regular lumps digging away

under the eyes and into both corners of the mouth: I have never seen them on other animals. To these pests I must still add the larva of some sort of dipterous insect, the Mosquito-worm of the Colonists, Gusano peludo of the Spaniards, which is generally dreaded. This insect lays its eggs under the skin where its larva quickly emerges and reaches a considerable size. When full-grown the mosquito-worm has a length of quite half-an-inch: the body is somewhat thickened in the middle: it is black-ringed in front. In the centre of the swelling which the larva occupies is the small unclosed opening which the female made with her ovipositor-sheath: it is only with extreme pressure on both sides of the tumour, and the consequent dilatation of the opening that it is possible to get the larva out, and then with indescribable agony.* As I never slept at night without pants it was all the more inexplicable to me how the insect found its way to my thighs, on which there soon developed eight such bumps. Pöppig, in the course of his Travels, mentions a larva that must be especially plentiful in Maynas, and there called Subja-curu: from the description given this appears to be identical with the mosquito-worm. In spite of wearing long trousers both day and night, I was nevertheless unable to protect myself from these frightful pests, and certainly a similar precaution would not have saved the Indians in Maynas. Stöckle and Smith remained just as little exempt from them as I did.

806. A loud bellow, very like that of a cow, and repeated at short and regular intervals, had already on the second night awakened me several times out of my sleep: the noise being absolutely foreign to me, I made the wildest conjectures as to its source of origin. I waited with impatience for the returning residents, but when in reply to my enquiry the people told me it was a frog, I thought they wanted to fool me. In spite of my doubts the Caribs stuck to it that it was the Konobo-aru, which lives in a particular kind of tree, with hollow trunk that is filled with water. As they were very anxious for me to confirm this with my own eyes, we quickly made our way down to the near forest on the lowland and soon stood in front of a tall *Tiliacea* with large leaves, which I had never seen before, and on closer examination turned out to be a new genus, to which Dr. Klotzsch has applied the name *Bodelschwingia* in honour of our magnanimous and meritorious Minister, von Bodelschwing. The peculiar blossoms of the *Bodelschwingia macrophylla* possess a very pleasant perfume, and the large leaves give the beautiful tree an imposing appearance. I have only found it on the Pomeroon and Barama. A peculiarity of the tree is that the trunk when it reaches a certain size becomes hollow. One of the Indians climbed the tree to stuff a round knot-hole that was about 40 feet up the trunk, after which the others set to work and cut it down. The hollow trunk was filled with a considerable quantity of water in which we did not actually find the disturbers of the peace but on the other hand discovered twenty tadpoles in the first stage of their development. Our search for the male or female was for the time being fruitless, and I had

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* I have seen the local application of tobacco-juice on the opening result in the expulsion of the worm.—(Ed.) The "Mosquito worm" is the larva of *Dermatobia hominis* or *D. cyanoventris*, infection with which is still fairly common in British Guiana. (F.G.R.)

to hope for nightfall when, as my companions assured me, it would certainly turn up and make its presence known by "bellowing." I must confess that it was a long time since I had waited for evening with such close attention. It might be 9 o'clock when the deep silence was broken by the croak. Provided with a light, I hurried with some Caribs in its direction which led us again to the felled tree. The bright illumination seemed to dazzle the frog which allowed itself to be caught quite quietly. It was the large beautifully marked tree-frog *Hyla venulosa* Daud. The whole body of this interesting creature is covered with an unpleasantly smelling slime, which it seems particularly difficult to remove from the enlarged toe-pads. Besides this, the animal when seized let flow a whitish juice out of its ears which, while brushing away some mosquitoes, got onto the skin of my face where it caused the most scorching pains: next morning the spots had turned a dark black colour, and after a few days the whole skin peeled off. The Indians described the frog at the same time as the most infallible weather-prophet because it only lets its voice be heard if rain is to be expected the following day: hence also its name—"*Konobo,*" rain, "*aru,*" frog. I soon found this statement to be absolutely true, particularly on the Barama where the creature is present in large numbers. As the *Bodelschwingia* disappears, so does the frog. Daudin, in his description, mentions nothing about the extraordinary croak of the creature.

807. On the second day after their return from the Mission the Kuamuta villagers celebrated a drinking-bout from which Missionary Brett had been just as little able to wean them as he had from their enjoyment of the uncleanly prepared drink. Their singing was uncommonly lively, the matter improvised, with each strophe repeated in chorus: the melodies generally were not characterised by such monotony as in those of remaining tribes. The less resemblance their singing had with that of the latter, the more did the conclusion of the festivities correspond with that of the carousals of all other Indians—for the whole company, men and women, got drunk. The closeness to the city and the almost continual intercourse with it may fairly be in part responsible for the fact that it is just amongst the Caribs that the drink habit has degenerated into an uncontrollable passion. I have been present at scenes with these people where I thought animals and not men must be playing a part. A specially characteristic and unfailing symptom of the commencement of drunkenness was the trouble they took to speak English to me when I would often find to my astonishment that people who in temperate moments pretended they did not know a word of the language, spoke it quite fluently. The fine drink had a further effect upon the chieftain of Kuamuta in that he told me his secrets: for he informed me that he possessed not one wife only, but three. The Domini (Missionary) had forbidden this, but so as to make him believe his orders were obeyed, he had built for the other two women, another home far away in the bush where he was wont to visit them: as the Missionary might accidentally meet them when calling at the village, they dared not be seen here. This confession gave me a deep insight into the mind of this out-

wardly converted Carib. Next day, in the course of my botanical excursion, I stumbled up against the very hermitage—of women.

808. I have already remarked that the Caribs differ essentially in their appearance from other tribes. Their skin-colour is much darker, their build of body much more robust, and their facial expression has more of repulsiveness than of charm in it. The unnatural overgrowth of the calves among the female sex makes it positively disgusting.

809. Vanity appears to be the hereditary failing of every female, for even the women and girls of Kuamuta wanted nothing but the small mirrors which I had taken with me for trade, and then sat for hours at a time in front of them, plaiting their beautiful hair and looking at themselves.

810. Judging from the large lumps of wax that were seen at Kuamuta, the bees already mentioned must be unusually plentiful in the forests. The residents collected it partly for trade, and partly for illumination. A few long threads of cotton wool are for this purpose rolled in the melted wax until they attain the thickness required.

811. A sharp attack of fever which not only afflicted me but also Stöckle, made us stay longer in the village than I had intended. On the day before leaving I went with some Indians to a settlement a few miles farther distant where, judging from the confused noise that reached us during the stilly night, a drinking feast must have been held. I hoped to be able to receive in exchange some interesting ethnographical objects.

812. As we were making our way through the forest and my eyes were searching the top of a tree, I felt myself suddenly held fast by the Indian behind me. A large black snake was crossing the path in front of my feet. A shot from my gun killed the seven-foot long creature. The Caribs called it Tapurauma and assured me, in spite of all my remonstrances that it was of the most poisonous kind and that a friend of theirs had died from the bite of one only a short while before. My contradiction availed nothing: the *Coluber plumbeus* Pr. Neuwied had to be, and must be, poisonous. The allegation that this snake commences to pick a quarrel and fight with every other snake that it meets was strange to me. The statement of my companions about its dangerous character was a fresh demonstration as to how little one can depend upon what Indians say in regard to poisonous or non-poisonous snakes: their inherent horror of these reptiles recognises every one as venomous.

813. The pathway connecting the two settlements led through rank virgin forest with giant trees, amongst which even the Mora was not wanting and through broad swampy ground overgrown with palms and *Scitamineae*. We again came across a huge army of wandering ants the approach of which was already indicated at some distance away by the crackling noise and rustling caused by their advance over the dry leaves lying on the ground. The procession was here also accompanied by a number of those interesting birds of the genus *Myiothera*. I managed to shoot some specimens of the beautiful *Pithys leucops*.

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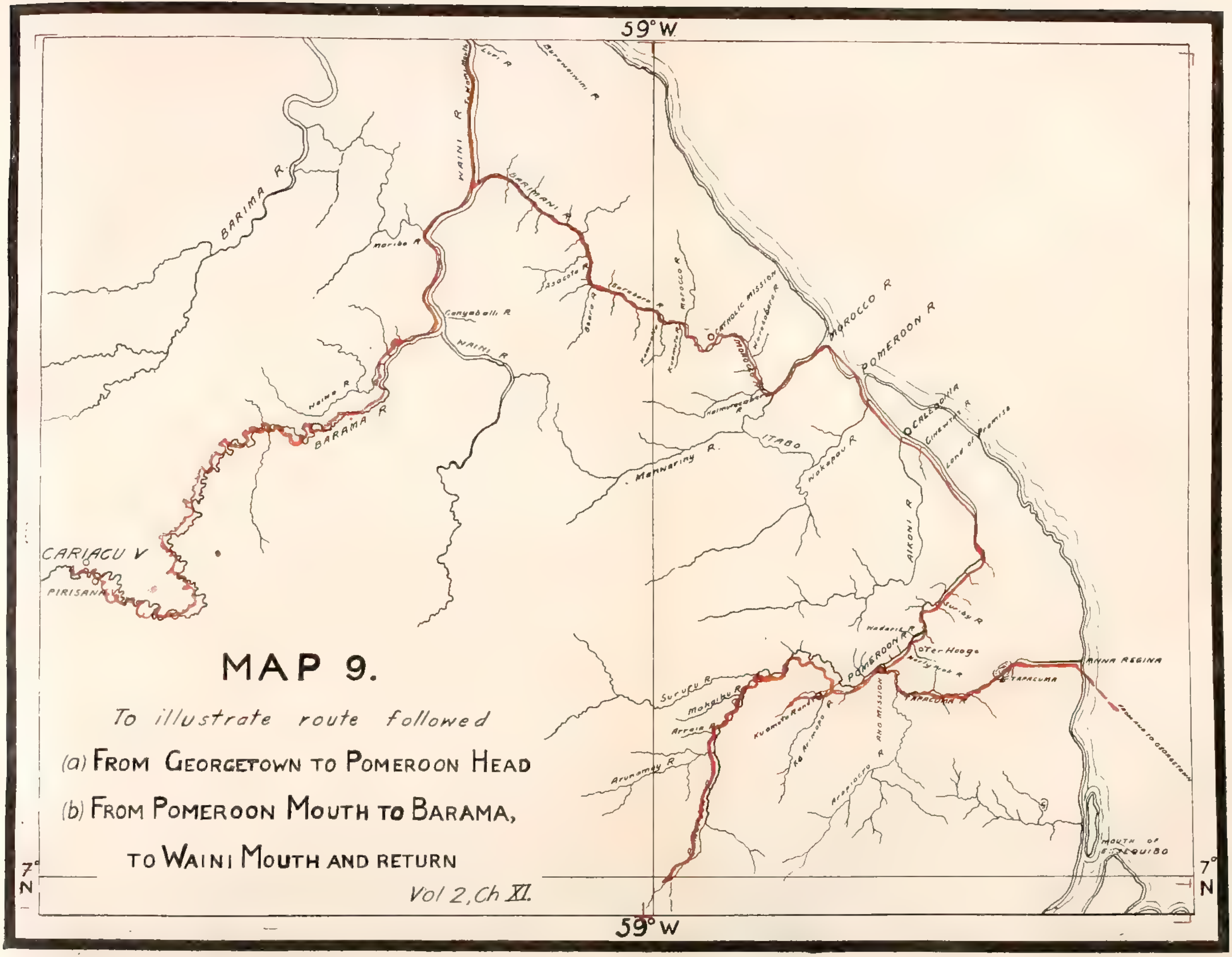
V.


59° W
Luri R
Barawaiwini R
WAINI R
To Waini Mouth
BARIMA R
BARIMANI R
Moribo R
Asacota R
Barabara R
MOROCCO R
Baero R
Kamwatta
Kuamuta R
CATHOLIC MISSION
Waraobaro R
Ganyaballi R
WAINI R
Haimuracabara R
MOROCCO R
POMEROON R
Waiwa R
BARAMA R
CALEDONIA
Cinewaru R
Land of Promise
ITABO
Mahwariny R.
Wakapau R
AIKONI R
CARIACU V
PIRISANA V
Suriby R
Wadaric R
POMEROON R
Ter Hooge
Arrival R
ANNA REGINA
TAPACUMA
Suruku R
Makaiku R
Arraia R
Kuamuta Rand
Kô Arimapo R
AHO MISSION
TAPACUMA R
From Anna to Georgetown
Arunamay R
Arapiacro R
MOUTH OF ESSEQUIBO
7° N
7° N
59° W

MAP 9.

To illustrate route followed

(a) From Georgetown to Pomeroon Head

(b) From Pomeroon Mouth to Barama, to Waini Mouth and return

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V. ROTH, del.

Small husks falling down on us from a giant *Mimosa* betrayed the presence of a flock of parrots in its top, which however, in spite of every effort of the Caribs to lead our dim-sighted eyes in the right direction, Stöckle was unable to distinguish amongst the green foliage just as little as I could myself. A shot from one of our men brought down a couple of specimens when to my astonishment I recognised the pretty *Psittacus madagascariensis* Lath. which one had hitherto considered indigenous to Madagascar. According to the statements of the Indians, the lovely bird only appears at times in the neighbourhood of Kuamuta and soon after disappears again. On the summit of some rising ground we reached the settlement that consisted of six houses. The male residents were still lying in their hammocks in a deep state of intoxication and the women who squatted around the fires on which large pots were standing, and who gazed at us with their bleary glassy eyes indicated clearly enough in what sort of a way they had painted the night red. But even greater confusion reigned in the chieftain's house where traces of civilisation, in the way of chairs, tables, plates and other vessels, were tumbled one over the other with large drums, calabashes, etc. All our efforts to get the unconscious people to talk were in vain, and in a temper I retraced my steps to Kuamuta. As I would be again touching at this village on my return journey to Georgetown I left my collection of botanical treasures here until I got back. During my stay the maximum thermometer recorded 85.7° F. and the minimum 78° F.

814. In company with several Caribs, I left the village on the 9th September. The strong current with commencing tide soon brought us into the Pomeroon up which we now made our way.

815. Although the vegetation of the low-lying banks was only medium, their edging was uncommonly improved by the charming spruceness of a number of bushes and lianas amongst which were particularly noticeable the beautiful *Carolinea princeps*, *Cassipurea guianensis* Aubl., *Tabernaemontana odorata* Vahl., *T. undulata* Vahl., *T. utilis* Arnott, *Posoqueria longiflora* Aubl., *P. latifolia* R.S. with yellow fruit, *Homalium Racoubea* Sw., *Guatteria Ouregou* Dun., and *Aberemoa* Dun. The *Cacoutia coccinea* and *Norantea guianensis* covered the highest tops of the trees with their flowery finery, while the slim *Leopoldinia* and *Euterpe* crammed with ripe stony fruits rose a long way beyond the foliage trees and were alive with parrots and marudis.

816. The high degree of cultivation to which the banks of the Pomeroon must have been carried in former times was even yet indicated by the extensive flats where the *Vismia*, *Mimosa*, and *Solanum*-bush now made a flourishing growth which was only surpassed by the ashen-grey trunks of *Cecropia peltata*. This characteristic vegetation that rises up so quickly on flats once cultivated but subsequently abandoned to Nature truly borders on the marvellous.

817. We had again proceeded several hours along virgin forest when an unexpected sight presented itself. Upon top of a 60 to 80 ft. high hill on the right bank was to be seen a house facing the water, from which an alley-way of cocoa-nut palms led straight up. It was a strange

sensation to find in the midst of this wilderness an absolute indication of advanced civilisation. At the foot of the hill a large half-tumbled-down shed, the roof of which was covered with creepers, and the large hearth with coppers, showed that the former owner engaged in the manufacture of arnatto, which, as I have already said, used to be carried on to a large extent along the area of the Pomeroon. "A white man," the Indians told me, "used to live here once, but after the death of his wife, suddenly abandoned the house and left everything it contained behind." I determined to spend the night here. Beautiful flowering bushes, huge *Agaves* and *Yuccas* were planted between the cocoa-nut palms. The dwelling-house on the hill, surrounded with the most lovely ornamental and economic trees from foreign climes, and the golden yellow fruit that forced itself into prominence from amongst the luxuriant verdure of the orange and lemon trees proved a welcome discovery. The owner must have been very fond of flowers, and had apparently possessed a cultured taste. Charming groups of *Jasmin Sambac, Melia Azedarach, Poinciana pulcherrima, Gardenia fragrans, Ixora, Hibiscus rosa sinensis, Clerodendron fragrans, Punica, Nerium* and the different *Centifolia* and Monthly Roses grew around the front of the sombre house and filled the atmosphere with their perfume, although they were already quite stifled by the *Mimosae* and *Solaneae* which seemed to have sworn to suppress and destroy the children of foreign climes. The back of the building was enclosed with a quantity of fruit trees such as *Persea, Mangifera, Mammea, Artocarpus, Anacardium, Psidium,* etc. The owner had tried to make his secluded home as pleasant as possible: besides that, one could enjoy from it a charmingly surprising view over the rank growth of forest enclosing the hill. Even our northern forests do not shew such a multiferous gradation of all shades of green. The building was apparently on the verge of ruin, and the steps leading to the gallery and main entrance of the house were already broken. The rooms were occupied by bats, lizards, spiders, and centipedes, which seemed to be not a little disturbed at the interruption, judging by the way they crossed over the walls in all directions when we entered. Ugly geckoes (*Hemidactylus mabouia,* and *Platydactylus theconyx*) at which my Caribs likewise shewed the greatest horror were at the same time crawling up and down them.

818. To ensure a quiet night we first of all waged war upon the enemy and without mercy chased them out of the room by burning off gunpowder. The heaps of earth on the floor with their blackened fire-sticks shewed that this house had been frequently used as sleeping quarters for the passing Indians who cannot spend the night without a fire under their hammocks. The thermometer recorded 85° F. in the open.

819. Next morning we made an inspection of the upper floor, in which we found all the furniture heaped up in one of the rooms, but already completely destroyed by the Termites. After plundering the fruit-trees we went on our way.

820. The banks of the Pomeroon became higher by little and little, the fringe of *Caladiums* disappeared and was replaced by low *Inga*

bushes around the blossoms of which beautiful humming-birds (*Trochilus pella*) were hovering. The Caribs call this lovely bird, on account of its two long tail-feathers, Kara-bimiti, i.e., Macaw humming-bird. It is indisputably the largest and most brilliant species met with in Guiana. One finds it in the greatest number along the banks of the rivers, particularly on small shaded creeks. The dear little creature is busiest at sunrise when it then without intermission flutters around the blossoms moist with dew. As soon as the sun's rays become too hot it hies into the deep shadows where it remains settled until its enemy once more approaches the western horizon. Up to where salt water reaches in the rivers one can search in vain for specimens. The little female is devoid of the brilliant metallic colouring as well as of the two long tail-feathers. The nest, which I frequently found on the Pomeroon, is usually built in a small fork on little branches bending over the surface of the water, or in the vines hanging down from them. Externally the nest has the colour of tanned leather and resembles, as regards its material, prepared spunk. But so as not to let either the eggs or young ones tumble out when the breeze shakes the slender twigs, the far-sighted parents provide the nest with a wide brim which is bent inwards. The young males only get their beautiful feathering and the two long black tail-feathers by the end of the second year: in their "early" days they resemble the females.

821. Towards midday we reached the mouth of the Sururu which joins the Pomeroon from the westward. The mouth of the tributary is just as wide as the bed of the main stream. The hitherto noiseless silence and lonesomeness of the forest was suddenly broken by a loud noise. A regular squadron of corials with Caribs was hurrying to the Mission, to stay over for the morrow's service. A glorious *Bauhinia* with dark red blossoms that I had not seen before, covered the extreme tops of the foliage trees with its lovely flowers. So also I came across for the first time that *Tiliacea*, the *Sloanea nitida* G. Don., so beautiful not only on account of its conformation (*habitus*) but also for its large glossy leaves. The tree is undoubtedly one of the most beautiful ornaments of the tropics.

822. Some miles farther up we got to the mouth of the Makaiku which also flows into the Pomeroon from the West. The latter had already lost much of its former width; on the other hand, the vegetation on its ever increasingly rising banks was getting more rank and the trunks of the *Mora*, *Lecythis* and *Laurus* becoming bigger. By the afternoon we had reached Akupautari, the Carib settlement. The village lay on the summit of a hill, which rose at a little distance from the waterside. A number of small corials that were made fast at the landing shewed that guests must already have arrived ahead of us, and the certainty that these could only have gathered here for one of those dissolute bacchanalian orgies, determined me to continue my journey rather than be a witness of those scenes where I had watched men sinking below the level of brute beasts. I had hardly expressed my intention before it met with the liveliest opposition from my companions. I had to give way. We entered the village along the beaten track, where the

very first glance confirmed me that the dreaded moments were already over, for in the first house I saw several men half-fuddled lying in their hammocks, and sleeping off the beastly effects of the drink. Awakened by our coming, they blinked at us stupidly, and then turned round on the other side to go to sleep again. A similar welcome was our lot from the women who squatted in an absolute state of nature at a repast that consisted of alligator-tail; they also looked at us for a few seconds with dulled eyes, then turned their backs and continued eating. In the next house the men sat in a circle around a somewhat more sumptuous dish because the alligator flesh was associated with another tit-bit, the large *Ampullaria orinoccensis* Ziegler: they took no more notice than if we were so much dirt. I went on. In the succeeding building several women were pouring the contents of large earthen pots into the large paiwari trough, and filling them afresh. It was only after considerable difficulty that I succeeded in finding the chief, who, however, was in the same condition as his subordinates and also did not want to have anything to do with us until a glass of rum made him more tractable: he then informed us in broken English that they had been drinking and dancing for the past two days, and that the feast would be concluded this very evening. My hopes of a rest were too hasty: sleep was not to be dreamt of because the confused noise, the beating of the drums, the fighting and the quarrelling continued until daybreak when the Akupantari residents staggered into their hammocks, and the visitors into their corials. As to-day was Sunday and I had no further disturbance to fear, I made up my mind to stay here until morning. On taking a stroll round the village I again killed one of those snakes, *Xiphosoma hortulanum* Wagl. which had its main fangs in the lower jaw: it was likewise rolled up on a bush, sunning itself. In the afternoon they brought me another snake killed close to the village in which I immediately recognised the terrible "Bushmaster": unfortunately the animal was quite smashed up. The chieftain told me that in cases of bites from poisonous snakes they apply externally and internally gunpowder dissolved in rum, with good results.

823. Next morning we proceeded on our way. It was only now when we might certainly be 35 to 40 miles in a straight line from its mouth in the ocean, that the influence of ebb and flow disappeared completely. The continually winding banks became even more steep, and the course, on account of the trees thrown down by the water undermining the former, ever more difficult. In isolated spots the fallen giants had formed regular barricades through which we had first of all to cut a way with axes. Among the low brushwood along the watersides several species of *Inga* were particularly noticeable: their beautiful large tufts of blossoms spread the most glorious fragrance around. The thermometer recorded 89° F.

824. Although still early, but nevertheless quite exhausted, we reached the landing place of Arraia, the Carib settlement, which likewise stood on an eminence in the forest about a mile from the western bank. The little stream Arraia flows in at the landing. As Arraia ought to be the last village on the Pomeroon I determined to spend a few days here so as to get some provisions.

825. The village consisted of 5 houses with 50 inhabitants whom—what a wonder!—I met in a state of sobriety: it was only the second settlement where this had been our luck. The women were busily engaged in finishing their earthen vessels. I soon learnt the reason for this extraordinary temperance. Both children of the chieftain, a boy and a girl, were laid up with a bad attack of intermittent fever, which had pulled them down almost to skeletons. In spite of the piai having erected his little sugar-loaf shaped house in close proximity and had every evening worried himself to drive the evil spirit out of the sick patients, he had not yet succeeded in doing so.

826. Though the Indian readily takes medicine from the white man, the latter must nevertheless be specially careful in dispensing it, and in diligently examining the patient. If the latter is already found in a doubtful condition and the sequence of the disease, as the pathological text-books put it, is "in death," I would advise no one to lend a helping hand: the piai who not unrightly recognises in the Paranaghieri his most vexatious enemy would give him a rough time of it among the villagers as being responsible for the fatal ending. I had nothing to fear from the feverish children, but gave each 10 grains of quinine, and next morning the usual hour passed without any attack: the evil spirit had been exorcised. The gratitude of the chieftain and his wife was boundless, and from that very moment the former became my very shadow: the long gaunt fellow with his huge hooked nose and a beard—the only specimen of such size and thickness I had as yet seen in an Indian—really tried to read in my eyes my every wish, and was infinitely delighted when he heard from one of his subordinates, who had been several years in town and could consequently speak fluent English, that I was making diligent enquiry into the history concerning his tribe. I am now putting down in shortened form what I learnt, partly from my grateful host, and partly from other Caribs on the journey.

827. The scattered settlements of the Caribs who, in former times when a dense Indian population still covered the new continent, were the mightiest, the most warlike, and at the same time the most industrious of the tribes, are nowadays chiefly met on the lower areas of the Mazaruni, Cuyuni and Pomeroon: one of their villages is now and again found isolated and solitary on the Corentyn, Rupununi and Guidaru. In British Guiana their total population might amount to 600. Outwardly they differ essentially from other tribes in their powerful and muscular frame of body. Their speech has also something unusually strong and manly about it, they utter their words at the same time with a decisiveness and vivacity, indeed with quite an imperious tone. What their speech hints at, is but the expression of the inward conviction which teaches them to believe that they are not only the lords and masters, but are proportionately feared as such by the remaining tribes. If a Carib walks into the house of another Indian, he does not first wait for the occupier to offer him meat and drink but haughtily and proudly casts a look round and takes what he fancies as his own unquestionable

property. Only extreme necessity can humble his arrogance and pride to work for the Europeans for wages. I have already mentioned how assuming and overbearing they shewed themselves to be towards us in general. Hunting, fishing, and the manufacture of the weapons and implements connected therewith constitute the chief employment of the men: everything else falls to their wives and daughters. Polygamy prevails with them throughout. Just as arrogant and tyrannical as the Carib is towards other Indians, so is he towards the opposite sex, and it would be a difficult job to find but one woman who does not carry a number of scars and wounds, the openly blazoned proofs of her husband's inhuman treatment which at almost every drinking bout degenerates into bestiality.

828. The peculiar custom rules throughout all the tribes in British Guiana for the women to eat apart from the men, a custom that Cook and Forster found indigenous with the New Zealanders, but amongst the Caribs this rule is carried still further by the women not even being allowed to eat in the presence of the men. If the latter are eating inside the house, the former must take their food outside. I will only mention one instance out of the many I witnessed of the inhuman brutality with which the Carib treats his women. The chieftain of Arraia had given me his son's residence, in which, besides a second family, he lived with his young and pretty wife, whom he had only married a short while before. The poor girl suffered with the most terrible toothache which increased so much on the second day after our arrival, that she could not refrain from groaning a little now and again. Her lord and master who had not left his hammock and had done nothing else but sleep, eat and whistle on his flute, while his wife, still suffering with the pain, carried on her heavy duties, had already throughout the whole day cast some dark glances in her direction. Before lying down in her hammock she yet lighted the accustomed fire under his, and then sought the rest she so much desired in vain because her sufferings, rendered evident by a light moan, made this impossible. Angered thereby the man suddenly jumped out of his hammock, took up a knife and cut the ropes to which hers was tied. The poor woman fell on the ground and dislocated her arm, but without troubling himself about her, the brute threw himself back into his hammock. The ill-treated creature silently gathered herself up, slipped out of the house, and at break of day, her swollen arm covered with bast, and even her face with a smile—brought her master's breakfast to his side. Without even deigning to look at her, the beast sat up to eat it. I was so angered that I complained to the old chief about his son's inhuman conduct, but he only looked at me in amazement and surprise.

829. The chief occupation of the women besides the household affairs, consists in spinning cotton with a fine spindle and in making hammocks wherein they show extraordinary dexterity. This industrial article is in general request on account of its durability although it is only made with the fingers, without the help of any apparatus: it takes the woman mostly a year to finish one.

830. As with remaining Indians, the men's weapons comprise bows, arrows, and war-clubs of which only the last-mentioned differ from those of other tribes by being decorated with an incised arabesque-like pattern. These decorations, which are repeated on their flutes, benches, pottery, etc., differ essentially from the designs amongst remaining tribes because they are never executed with straight and broken but always curved lines, which not only their own common traditions but also those of other Indians convinced me that their forefathers had immigrated from the Islands. They have no blow-gun and know just as little about urari poison and its preparation.

831. Since their appearance on the continent of America the Caribs have been the terror of the indigenous tribes, and Salvator Gili who visited Guiana during the first half of last century already drew attention to the devastating slave-raids carried on by them, particularly against the Macusis, in which they were especially encouraged by the then owners of the soil, the Dutch. As on the Pomeroon and Essequibo, the Caribs also supplied the estates' owners on the Corentyn with slaves in barter for European articles, a trade that was carried on through the Postholders under the authorisation of the Governor of Surinam, in return for which they had to deliver every sixth slave to him for nothing. In Paramaribo they even paid a Colonial interpreter with a knowledge of the Carib language, partly to represent the mutual interests of Indians and Government, and partly to learn from the imported slaves to which nation they belonged, so that no Indian should be bought from a tribe, *e.g.*, the Caribs, Arawaks and Warraus, with which the Government had concluded treaties. Since Emancipation the Caribs have been forced to abandon the trade at least on British soil although it still flourishes in Surinam as my brother learnt from experience during his journey in 1836 on the Berbice, where he met a party of Caribs who wanted to go to the upper Essequibo, invade the territory of the Macusis and bring their captives to Surinam. Fortunately he succeeded in frustrating their plan. But even at the present time one now and again finds slaves amongst the Caribs whom they call Poitis. The report which earlier travellers brought to Europe that Carib women spoke a language different to the men may well be due to the fact that they mostly kept the girls kidnapped from other tribes as their wives who then, if several were to meet in a village, might retain their mother-tongue.

832. Although the Caribs in the Colony are generally accused of cannibalism, especially by the Negroes, who still relate with horror what their parents told them about their eating the flesh of the fallen during the quelling of the Negro uprising in 1763, this was distinctly denied not only by my old chief but by all others from whom I made enquiry. The former told me the following about it. After a victory gained, their forefathers usually brought back to the settlement an arm or leg of the slaughtered enemy as a trophy, which would then be cooked so as to get the flesh more easily off the bone: a flute was made out of this to be used as an instrument on the next war expedition. One still frequently finds in the Carib camps such flutes made from human bones. At the big feasts which were celebrated immediately after their return in honour

of the victory obtained, these trophies played an important rôle, and it was open to anybody to taste the cooked flesh. In order to increase, however, their courage and their contempt for death—a property that was ascribed to this measure—they cut out the victim's heart, dried it at the fire, pulverised it, and mixed the powder with their drink.

833. Courage and bravery alone claimed respect: the more foolhardy the former, or the more conspicuous the latter, the greater shone the name of the hero in their war-songs. If a new chief had to be chosen, the candidate for the honour must submit beforehand to the most gruesome and cruellest ordeals to put his courage, his endurance, and his steadfastness to the test. Such trials were a long, extremely stringent fast which ended with the famished individual having to drink to the bottom a large calabashful of a strong decoction of peppers without pulling the slightest face. Were this successfully accomplished he would be placed in a hammock filled with large ants, which would be tied tightly above him so as to prevent the tormentors getting away, and here without a groan, without a movement, he had to bear for hours the attacks of the excited and irritated insects. If he bore all these ordeals with equanimity he would be acknowledged chief with cheers: his will was thenceforth that of the whole company.'

834. Scorn and contempt were the lot of those who attempted such ordeals without being able to stand them. The force of education that teaches them already in earliest childhood, to bear pain, and the thirst for glory are so strongly developed that they will brave the greatest martyrdom so long as they succeed in attaining their ambitions.

835. If the occupants of a settlement wanted to secure victory for their warriors who had started for the fray, and to refer at the same time to the results of the battle perhaps already raging, they took two boys, placed them on a bench and whipped them mercilessly over the whole body, but especially the shoulders. If they bore the pain without shedding any tears or sobbing, the victory was sure. One of the boys was then put into a hammock out of which he had to shoot at a target fixed to one of the roofs: the arrows that hit the mark indicated the number of enemy that would be slain.

836. That the child should inherit his courage the father resigns himself, at the birth of his son or daughter, to very painful ordeals, just in the same way that the girls had formerly to undergo very gruesome tests when arriving at womanhood: the present day has moderated a lot of this also. Having first of all had her hair burnt off, the girl was led to a stone where the piai, with the incisors of the *Dasyprocta,* made two deep incisions along her back from shoulder to shoulder which he then rubbed in with pepper, without her daring to utter a single cry of pain. After this operation, and with her arms bound to her side, she was put in the hammock and an amulet of teeth hung round her neck. At the end of three days, without food or drink, and not permitted to say a word, she was again carried to the slab, without her feet being allowed to touch the ground, her arms untied, and then again brought to the hammock: she must now keep to it for a month and have nothing else to

eat but uncooked roots, cassava bread and water. At the end of this time the operation was repeated and only after the expiration of the third month was the ordeal finished.

837. Their marriages are celebrated exactly as among the Macusis: in the same way lying-in is also practised. Next to the chief, the first person in the settlement is the Piai who is generally feared. When a resident dies, he is either buried outside the house and the grave opened again after a time, the relatives taking up the bones and dividing them among the dependents, or else the body is laid in a hammock where it is washed and watched by the women and nearest relations, so that it may not be disturbed by birds of prey or insects. When putrefaction has set in sufficiently, the women clean the bones, paint them and put them in a basket, wherein they are carefully preserved. If the settlement is abandoned by the occupants, the bones are taken with them. The women who prepare the bones are considered unclean for several months after.

838. From the time of the discovery of this important continent, none of the remaining tribes of South America received such notoriety in Europe as the Caribs: this was due a good deal besides, to the impeachment of cannibalism, and the news of the wealth of noble metals which they understood how to work. With Sir Walter Raleigh begins the series of marvellously fantastic accounts of the tribe and of the district which it occupies as well as of the wealth of metal that must be hidden in it: he wanted to substantiate the truth of his statements by the quantity of sterling gold he had obtained from them, so as to serve the purpose of making Queen Elizabeth turn a favourable ear to his far-reaching projects. Raleigh had associated a good deal with the Caribs and Bancroft relates in his Natural History of Guiana* the following: "The Carribee Indians retain a tradition of an English chief who many years since landed amongst them, and encouraged them to persevere in enmity to the Spaniards, promising to return and settle amongst them and afford them assistance, and it is said that they still preserve an English Jack which he left them, that they might distinguish his countrymen." This was without doubt Sir Walter Raleigh, who in 1595 landed on the coast of Guiana to find the wonderful golden city Manao El Dorado, and captured Fort Joseph on the Orinoco. As to the wealth of gold, the reports of the oldest travellers, especially of some of the missionaries of the Society of Jesus who were sent to the Orinoco district, correspond with Raleigh's accounts. Gumilla, Cayley, Lawrence Keymis, d'Acuña and Herrera all speak of the large quantity of gold and silver dust, and the amulets of gold found amongst the Caribs, which they themselves knew how to work. Gumilla reported that a century previously the Caribs in the environs of the Orinoco wore as ornaments gold plates which they themselves manufactured: a statement that is strengthened by that of Alexander von Humboldt, who at the same time states that even up to 1760 the independent Caribs had gone to the Cerro de Pacaraymo, to collect gold dust in their drinking cups and to sell it to the Dutch on the Essequibo, as the Caribs of the Essequibo, Caroni and Cuyuni know how to wash gold out of the earth.

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* London, 1769, p. 259.

839. In the course of our journey we did not find a trace of worked gold nor any in a raw state: I have already spoken of the absolutely fruitless attempts of the Dutch. The total disappearance of the bits of metal might easily find an explanation in the intercourse that arose later on with the Europeans, though it still always remains a surprise to me that the source of origin of the metal has continued hidden. If Guiana possesses metalliferous stone it can only be found in the Pacaraima Ranges or in the environs of Roraima, particularly towards the Cuyuni.

840. We still came across the carved animal-figured benches and stools mentioned by d'Acuña, not only in this tribe but among the Arawaks.

841. Before bringing this hasty sketch to a conclusion I must still add a few remarks about Mahanarva, the Cazique of the Caribs, mentioned now and again in the course of my travels, who even up to 1810 put the whole colony into a state of consternation and excitement. It was in this year that Mahanarva, now so notorious, came down the Essequibo to Demerara along with several of his dependents to pay the Governor a visit and struck a note of alarm throughout the whole colony by his description of the extent of his tribe and the unbridled courage of his innumerable warriors. The plan of the wily savage succeeded admirably. The absolute ignorance of the interior of Guiana and the dread of the depredations of the Caribs whom the Colonists had learnt to recognise as the most dangerous enemy to their progress, caused the Court of Policy to accept his empty bragging as the truth and to agree willingly to the conditions offered them by him, to keep his wild hordes at peace with the Colony. As a matter of fact Mahanarva punctually obeyed the invitation that was given him on his departure, to come back again the next year and fetch the stipulated tribute again. The enhanced accounts of his power to which he gave expression on his second visit, induced the Governor to send a Commission to the country of this proud and mighty Cazique, and satisfy itself by direct enquiry as to his alleged influence. At the head of the expedition, which at the same time was to go up the Rupununi to Fort Sao Joaquim and enter into negotiations with the commandant concerning trade on the Rio Branco, was Dr. Hancock, a physician practising in Georgetown, the father of our companion. These were the first English and Dutch colonists who, subsequent to Hortsmann, whom Alexander von Humboldt mentions in his travels,* visited the interior of British Guiana. The expedition fortunately afforded results quite different to what were feared. Mahanarva and his mighty crowd sank down to the level that they were: gentlemen had let themselves be fooled by a wily savage. The "Observations on British Guiana" published by Dr. Hancock in 1835 gave the first information concerning the interior of the country.

842. In Arraia I learnt of another plant which the inhabitants use for poisoning the very numerous fish on the Pomeroon. It was the *Clibadium asperum* DeC. of which they chopped the leaves into a pap

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* See Voyage aux Reg. Equin. du Nouv. Cont. Tom. VIII liv. VIII chap. XXIII page 17.

and mixed with tiny cut-up bits of meat so as to make little balls of them ready to be thrown into the river as bait: it was greedily swallowed by one species of fish only, and that the *Leporinus Friderici* Agass. which soon rose to the surface and died. Ingenuity was shewn by the way in which with a so-called spring-hook the coastal tribes caught the tasty haimura (*Macrodon Trahira* Müll.) which during many times of the year forms the only food of the Indians. For this purpose he takes a 6 to 7 foot long elastic rod, as thick as his finger, and with a short string fixes a hook to the extremity of it. The thick end is stuck firmly into the bank at the water-side. Immediately below the surface, the rod has a notch in it into which another one at its tip can exactly fit. When the thick base of the switch has been driven in, the fisherman bends the tip over and downwards and fixes the notches together. The hook with its bait is dropped into the water, and as soon as the *Macrodon* or other fish takes it, the notches are unloosened, the rod springs up and takes the fish with it. Should the fish prove too heavy for the elasticity of the rod and remain in the water, it mostly becomes the prey of the pirai or kaiman.

843. Owing to its sharp bite, the *Macrodon* belongs to the most dangerous of fish and I have seen wounds, consequent on the carelessness of the fishermen, that have surprised me.

844. The variation that I noticed in Arraia between Caribs and remaining tribes as regards foodstuffs was extraordinary. The Carib will never eat a monkey and while the Macusi only partakes of the flesh of an ant-bear when forced by necessity, the Carib regards it as a very great luxury, etc.

845. After providing myself with adequate supplies, I resumed my journey up the Pomeroon in company with the old chief and some of his subordinates, because my companions from Kuamuta had gone back there. The farther we pushed our way, the more rapid became the current. The 4 to 6 ft. high banks consisted here also of a reddish greasy loam through which veins of white clay in isolated places ran their course. The *Inga*- and *Vismia*-bush* along the immediate water-side was completely covered with the large yellow blossoms of *Lundia Schomburgkii* Klotzsch, while the shrill piping of the *Muscicapa vociferens* Pr. Neuw. resounding from the tops of the sky-scraping *Mora*, and various *Lecythis* and *Laurus* trees, re-echoed through the forest. Next morning before even the dawn of day, the note of another bird made a different impression on me, for I thought I heard the sounds of a glass harmonicon joining at absolutely regular intervals to form a peculiar melody. The notes, as clear as a bell, had something so deeply insinuating, so delicately musical about them, that at first I really did not know what to refer them to. I listened to the singer in silence and surprise until my coloured men told me it was the "Flageolet bird" or "Singing Frenchman" of which I had already heard from the Colonists by repute, but hitherto had neither seen nor listened to. Martius and

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* I have never yet anywhere else found the genus *Vismia* so predominant as on the banks of the Pomeroon. I collected here *Vismia guianensis* Pers., *V. sessilifolia* Pers., *V. cayennensis* Pers., *V. latifolia* Chois., *V. acuminata* Pers., besides discovering two new species—*V. Schomburgkiana* Klotzsch. and *V. Sieberiana* Klotzsch.

Pöppig mention a similar bird and are likewise enchanted with its song: according to the latter it is called Organista or Flautero in Peru. As day broke I saw the lovely songster hopping among the brushwood. It belongs to the genus *Cyphorhinus* Cab. The forehead and breast of *Cyphorhinus cantans* are rust coloured while the sides of the neck show black and white stripes: otherwise its plumage corresponds exactly with the genus *Tryothorus.* The pretty bird is already described by Buffon who calls it *Turdus cantans* (Musicien de Cayenne, Musician Thrush). On examining a specimen brought in spirits, Johannes Müller discovered that it possesses the complete singing-muscle apparatus of singing birds. Swainson has also figured it in his "Selection of the Birds of Brazil and Mexico," plate 14, without, however, mentioning its glorious note: he calls it *Tryothorus carinatus.* The Caribs called it Deko-deko, the Macusis Ruideng, the Arekunas Picompai. I have already mentioned the lovely voice of the *Tryothorus platensis* Pr. Neuw.

846. In the many small forest streams which we passed during the course of the day, but are almost completely devoid of water during the dry months, I found the *Ampullaria orinocensis* in considerable quantities: I sought in vain however for the large *Ampullaria urceus.* I was satisfied here that the *Ampullaria* living in the small creeks that are mostly dried up during the dry season lie embedded in the solid mud for months at a time without having a drop of water and yet continue to live within their operculum-closed shell: my attention was drawn to the fact by my companions ploughing them up from out of the hardened bottom, for as I have already stated they regard these snails as delicacies. The river itself, throughout the course of the day, continued coming from the S.E. but owing to its bed being almost completely filled with overturned trees was hardly 30 feet wide now. We pitched camp at the mouth of the small stream Arunamay, that flows into the Pomeroon from the S.W. and set our spring hooks. During all my travels I never found howler monkeys as plentiful as they were here.

847. Next morning the barricades became more impenetrable than ever and the vegetation along the banks more rank, until it finally reached the state of wantonness that had so often surprised me. Trees felled by the wind furnished us with quite a peculiar landscape to-day. The torn and splintered trees on both sides of the straight course along which it had run showed that the real force of the wind had been limited to a definite width, within the area of which all were lying uprooted, and resembled trampled-down reeds rather than forest giants.

848. It soon became impossible to force our way through the obstructions: the boats had to be hauled over, a labour that was much lightened by a simple procedure on the part of the Indians. When we came to such a spot, they peeled off long strips of bark from the *Inga* trees, the inner side of which contains a gummy slime, laid these with the slimy side up upon the timbers, and the boats were then slid over just as easily as sledges over snow. The river-bed soon had but a breadth of 20 feet. The flora of the banks contained many of the plants described by von Aublet. Trees and bushes were alive with birds and quadrupeds, among which latter the large packs of bush-hog often gave

me a fright as we scared them out of their cosy muddy beds and they, crawling through the dense underbush, would make a dash for the forest, when certainly many a straggler would be stopped short by the well-aimed arrows of my friends. Just as plentiful were the parties of *Cebus*, some of which were bestirring themselves upon the trees, while others would be on the ground searching for insects or quenching their thirst at the creek. Whenever I happened to sneak upon one of these simian communities unnoticed, I had to exert my utmost endeavour to repress the burst of laughter aroused in me by the comical capers of the youngsters, as well as by the seriousness and earnest behaviour of animals already bleached with age. If I found this impossible, and gave vent to my feelings, the result was the most precipitate flight and the most extraordinary noises. At one of such scenes I was again witness of a truly touching example of a mother's self-sacrificing affection. I was just about getting back to my boat when the excited voice of a young monkey in the tree overhead signified that it had been forgotten by its mother as she hurriedly made her escape. One of my Indians climbed after it, but hardly had the little creature seen the strange figure than its fright gave rise to still louder cries which were suddenly answered from the next tree by the returning mother. No sooner did the anxious little thing hear her voice but it answered her in quite a different key which now on the other hand found its echoing wail in the attracted mother. Keen on seeing what she was going to do in view of our having surrounded the tree on which her youngster was located, I had not paid any attention to the Indians. A shot wounded the poor mother, who was certainly prepared to make a bolt for it, but immediately turned back on hearing her youngster piteously screaming again: in spite of a second shot that missed she made a big effort and sprang onto the very limb which the wailing offspring occupied. She quickly put it on her back and was just about to get away when, in spite of my strict orders, a third shot killed her: even in her death struggle she held it tightly pressed and sought escape but, in the attempt, fell to the ground. On returning to the boat, an Indian pointed out to me a large snake beautifully marked with black and yellow, *Coluber variabilis* Kuhl, which was sunning itself on a bush. A shot with the gun put me in possession of it. It measured 7½ feet. It is interesting to watch the almost incredible rapidity with which snakes wind their way over the bushes and on the branches of the trees. In the thicket along the banks I was astonished to find a number of cacao-trees, laden with their beautiful yellow fruits. As settlements had never advanced as far up as we now were, the seeds must have got here at all events through some other agency, for I hardly believe that they are to be found wild on the coast and in this latitude. A special reason for this assumption is further, that the coastal tribes have no particular name for the tree, but also call it cacao. In the neighbourhood of the equator, on the tributaries of the upper Amazon stream and of the Corentyn, my brother frequently came across great stretches of wild cacao-tees. A dull rumble in the West, like the sound of a distant salvo of artillery, gave us a surprise towards evening: the Indians said it was trees being felled by the wind.

849. The difficulties increased so much at last that I could no longer contend against them with the small strength remaining at my command, and I found myself forced to abandon my plan of following the Pomeroon to its source, although it could not be very far off now. The Sierra Imataca is at all events the source of the Pomeroon, and judging from their entire course, several mountain ranges for which the Indians had no name however, appeared to be the spurs of this chain. The source must be somewhere about 6° 48′ lat. N. The thermometer recorded but 78° F. to-day.

850. The rapidly-running current brought us back to Arraia within 2½ days; after a two days' stay we left it in company with its intelligent chief. I soon reached the mouth of the Sururu again, and this I turned into with a view to following its course a bit. Like the Pomeroon, it is also occupied by Caribs. Towards evening we met one of them fishing: he had to act as guide to the village because without his assistance in and among the thick growth along the banks we would never have found the mouth of the creek on which the settlement lay. These small forest streams generally participate in the rise and fall of the tide, but for the most part cannot be navigated by larger boats except during flood, unless the uprooted trees make this impossible.

851. The residents received me with sullen and sinister looks and let me remain standing without taking any notice of me: they did not even once ask for rum, which made me ponder all the more over their ill-intentioned countenances because this request had on every occasion formed part and parcel of their welcome. At daybreak, when I wanted to resume my journey as quickly as possible, Stöckle brought me news that the corial was up and dry, and that we should have to wait for the incoming flood: this however would not be before 11 o'clock. A number of parrots that had flown at dawn over our heads with many a wild screech and had settled in the environs of the village upon the *Mimosae* and other berry-bearing trees were too tempting for me not to shoot a few for our midday meal. It was *Psittacus Dufresnii*, a species that I had not hitherto come across.

852. No sooner had the water reached the required level than we left the village with its surly occupants, and paddled into the Sururu which we followed up its course. To-day was to be crowned with an interesting botanical discovery. A *Strychnos* covered with white blossoms ornamented the banks and filled the air with the most delicious fragrance. Although I was immediately struck by the similarity of the whole shape of the plant with *Strychnos toxifera*, I nevertheless could not convince myself of the identity because we had sought for the blossoms over a year in vain, and its presence on the low coastal lands as compared with the granite and quartz rocks of the Canuku, 3,000 feet above sea-level, seemed too anomalous. And nevertheless, where I had not searched for the flower, there I had actually found it, because on my return to Berlin the species discovered on the Sururu proved to be

Strychnos toxifera,* the locality of which was not even known to the Macusis. The difference of soil, as I am now convinced, exercises a peculiar influence upon the specimens from the Canuku Ranges: the latter show on the young shoots, where the flower-stalks usually appear, a number of tendrils that were completely wanting in the flowering specimens from Sururu, and on closer examination proved to be modified flower-stalks: a degeneration that is specially peculiar to species of *Strychnos*. Probably the locality, perhaps the want of sunshine, or even the nature of the soil, contributes to this modification. I could now also understand the statement of the Macusi Indians who accompanied me to Ilamikipang, that the plant never blooms. The specimens found on the Sururu vary somewhat not only amongst themselves, but also from those coming from the Canuku Ranges as regards the shape of the leaf. Dr. Klotzsch considers them varieties and calls those from the Canuku *S. toxifera* (a) *acuminata*, and those from the Sururu *S. toxifera* (b) *latifolia*, and *S. toxifera* (c) *obliqua*.

853. Although we passed the landing-place of a settlement towards evening, I preferred to pitch camp in the forest instead of again having to witness the wild orgies which, judging by the confused noise that with sundown reached us from all sides, must be being celebrated every night. In the course of our trip up, the banks of the Sururu became always higher and the vegetation more gigantic: I saw *Lecythis* trees 160 ft. in height. The forest moreover consisted of *Laurinea*, and rank bushes of *Mabea Pirini* Aubl., *M. Taquari* Aubl., and *Homalium Racubea* Sw.

854. An unusually sharp attack of fever, and the uprooted giant trees narrowing and barring the stream, forced me to turn round and enter one of the Carib villages situate not so very far from the banks where the few men met with, already half intoxicated from tasting the drink for the feast to be celebrated the following evening, offered me just as little welcome, but the most sullen and distrustful looks. However much I might have wished to leave the settlement again on the following morning, the fever had increased to such a pitch that I was unable to leave even my hammock, and so had to resign myself quietly to my fate. At break of day, as Stöckle informed me, the few men had left their settlement and this roused my anxiety afresh. Towards evening an awful yell frightened me all of a sudden out of my febrile fancies, and made its way towards the house which was soon filled with at least 20 armed and drunken Caribs who, surrounding my hammock, their eyes sparkling with anger, pressed in upon me. I found myself in a tight fix. Tired and exhausted from the fever, and without the slightest inkling of what could have induced this hostile demonstration, though every instant expecting that the war-clubs swinging over me would strike, I resigned myself to my fate, because they had likewise surrounded Stöckle and the coloured men, and allowed neither me to get to them, nor them to me. The attempts of the female portion of the community to prevent the drunken men from committing violence seemed only to

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* The technical description of the plant, in Latin, is omitted here. (Ed.)

inflame their fury the more: when, as a friend in need, in came the chief. He spoke fairly good creole Dutch and I addressed him in the following strain: "What sort of Carib was he to treat like this a sick stranger whom he had received in his house, and who had never done him any harm?" His reply explained not only the sullen reception in the previous settlements, but also the intentions of the crowd around me. At Arraia I had refused an impudent demand from a young Carib: to revenge himself for it, he had spread the news in all the settlements that I was a spy in the service of the Spaniards (Venezuelans), who would soon follow me, and take into slavery the young and robust members of the tribe about whom I had given them information. In a sober condition they were not willing to put me out of harm's way and they therefore had first of all got drunk to commit this heroic deed. It was late before I convinced the excited souls thirsting for revenge that it was a slander. By nightfall already 100 people were gathered for the feast, with the effects of which not only the men but also the women and children were soon overcome. It was an awful night—and I was delighted when day broke. Though I felt so sick and miserable, for which the excitement of the night before might have been a good deal responsible, I nevertheless had my things packed and started on the return journey, as I had heard yesterday that the feast was going to be kept up for several days. What a contrast there was between the lovely tintinnabulary notes of the Singing Fenchman (*Cyphorhinus cantans*) sounding in my direction from out of the river-bush and the dissolute noises of the brutish drunkards! Unfortunately my condition got worse hourly: in addition to this, prickly heat so annoying to a European, had spread all over my body for some days past and plagued me to such an extent that I could rarely get a few hours' sleep at night and was always longing for an undisturbed rest. I thanked God when we finally reached Kuamuta where, to my very great joy, the residents were evidently all away. The fever, coupled with that intolerable itching of the skin, robbed me of sleep, and I determined to stay here a few days and get rid of both the troublesome complaints.

855. During my previous stay at Kuamuta I had made many enquiries concerning the curious *Lepidosiren paradoxus* Natt. and described it as accurately as I could to the Indians who assured me that they knew the fish and that it lived in the swamps and small creeks: but instead of the *Lepidosiren* they always brought me two other eel-like fish, *Sternopygus virescens* Müll. Trosch. and *S. lineatus* Müll. Trosch. which the Colonists called "Snake-fish." On this occasion the Indians also told me a good deal about an animal that they called Anaka-pataima, "Snake with two hands," it was said to be three or four feet long, of a brown colour, to live in swamps and only at night to search for its food which consisted of frogs and insects. Besides this, they said that in the forest at Kuamuta there lived an especially poisonous and curious creature of which they were unable to furnish me with a description frightful enough. One day they brought me the awful beast, carefully squeezed between two bits of wood: it was nothing else than the harmless glow-worm, *Fulgora laternaria*.

856. After staying here four days I had recovered sufficiently to allow of my continuing the trip. I accordingly left Kuamuta and the Carib country once more. The current soon carried us down to the mouth of the Arapiacro where however I did not find my friend Blackburn: he had accepted the management of Plantation Caledonia on the lower Pomeroon. As I had to return here in any case I got the old negro who had charge of the unoccupied building to let me have the keys, and I opened up my collections in the upper rooms.

857. Next morning I proceeded further down the river. The vegetation on the banks became gradually more and more uniform and it was but rarely that my eyes recognised anything new: amongst the few latter however I found a new species of *Siphonia, S. Schomburgkii* Kl. The tree possessed the "gum" in real superabundance, and Dr. Klotzsch was certain that he had never found it in so large a quantity in any species. Could more or less of the secretion be dependent upon the stage of development of the tree? The tree was not only full of shoots but also covered with blossom.

858. About sundown we reached the abandoned estate Caledonia which had only been taken over by Mr. Blackburn on account of an extensive cultivation of plantains. The rank condition in which I had already found it two years ago had naturally increased still more: the mosquitoes at night taught us pretty forcibly that we were again close to the coast. Dumbarton Castle, Caledonia, and Land of Promise the three estates now left on the Pomeroon that used to be cultivated formerly to such a large extent, are likewise going to ruin, probably to make way for a negro colony.

859. At some 25 miles from the mouth the stream had aleady taken on a salty taste, while the water hitherto clear had assumed the dirty earthen milky colour which the ocean, owing to its clayey and muddy strand, possesses for some miles out to sea. The vegetation, with the change in taste and colour of the stream, altered as if by magic: and out from the shady *Rhizophora* and *Curida* bushes, we could hear the buzzing of swarms of mosquitoes as we travelled along the banks. We reached the mouth of the Wakapau, which during the rainy season, by means of itabbos, provides water communication with the Manwariny and Morocco: the water was now too low for us to take this route. Mr. McClintock and his wife gave me a most hearty welcome. From a letter received here from Mr. Fryer, my brother had not yet arrived in Georgetown, and so I was able to continue my journey farther and fill up somewhat the gaps remaining in my consignments of living orchids.

860. The activities displayed in the immediate neighbourhood of the coast during the crab-season afforded an interesting sight. August and September are the months in which the land crabs (*Gecarcinus ruricola* and *Uca una*) march out of the swamps into the sea to lay their eggs. Hundreds of corials filled with Indians now come down to the coast from far inland to gather the countless animals, their favourite food, in large round baskets, plaited out of palm-leaves, and returning with them to their distant settlements where the creatures can be kept alive for some time in sweet water. One also sees the crabs coming out of their holes in

February, which appears to be their time for fertilising. The males commence to lose their pretty colour and their flavour, while an unpleasant bitter watery material fills the whole body, which is lost after the period of copulation when they again become gradually fatter. Towards the end of July, the crabs commence to grow afresh, and prepare for the casting of their shells: for this purpose they fill their holes with blades of grass and leaves, make their way inside, stop up the opening and remain there motionless until the old shell becomes replaced by a new one. It is not known for certain how long this lasts, but it is after this stage that the crab is at its best. Besides the Indians, August and September attracts several quadrupeds to the immediate neighbourhood of the coast, particularly the raccoon (*Procyon cancrivorus*), "Crab-dog" of the Colonists, Oghia of the Warraus, which finds the crabs just as tasty as do the natives. This only appears in the coastal areas: the Macusis do not know it at all. On catching the crab, it first of all bites off the claws so as to devour its prey at ease. It is a mistake to say that the *Procyon cancrivorus* does not dip its victim in the water, because amongst all the many tame specimens that I met in almost every settlement near the coast, I never saw one that did not devour anything without previously immersing it. Raccoons are smart climbers and at the same time easily skip from branch to branch. On the ground they increase their speed by taking big jumps which however are always in an oblique direction. On the coast there is said to be another species which in its markings differ essentially from P. *cancrivorus*, though neither my brother nor myself ever came face to face with such an one. They are in no sense the friendliest neighbours to the poultry on the estates.

861. The varying height of the flood tide along the coast between the Waini and Demerara is extraordinary. While the rise is 10 feet on the Demerara, it amounts to only 8 feet on the Pomeroon, and to but 4 on the Waini. This slight rise in the tide is generally ascribed to the mouth of the Orinoco, the waters of which are borne down to the ocean with such force that they hold back the increase of flood in their neighbourhood. As there was still some time to spare, I made up my mind to go to the Morocco, and then across the itabbo to the Waini, follow it to the mouth of the Barama, up that river to where my brother touched it on his trip to the Cuyuni, then return to the Waini mouth and so make my way once more to the Orinoco.

862. Two days after my arrival at Mr. McClintock's I left the station in his company, for the mouth of the Morocco, which lies about 7 miles to the West of the Pomeroon. We were unexpectedly caught on the open sea in a strong squall with thunder-showers which, owing to the wild breakers we had to steer through, might almost have sent us to the bottom. After advancing 11 miles up the swampy banks of the Morocco, we reached on its eastern or right one the mouth of the Manwariny, whence the course of the main stream turns more to W. by N. A little further on the same side, it is joined by the Haimura-cabara. Beyond the mouth of the Para, the Morocco turns all of a sudden to the North and describes apparently a

half-circle in its course. Several miles farther on the Waracabara flows into the left bank. After this there arise at irregular intervals and at different heights, the hills occupied by the Spanish Indians, as already mentioned.

863. Missionary Cullen had not only got a large new church, but also a new residence where he received us with his usual heartiness and joviality. As the reverend gentleman detained me several days, I took the opportunity of examining the hills as far as it were possible. They consist generally of sand, conglomerate of pebble and gneiss, and large quantities of burnt clay mixed with iron ore, the undoubtable evidence of the awful forest-fires, with which the coast between the Pomeroon, Mahaicony, Abary and Morocco is so often afflicted. The fires are mostly due to the accumulation of the huge masses of vegetable residue which through the continued drought soon assume the inflammability of tinder. These fearful fires generally destroy the fertility of the soil for several years. I was also shewn on one of these hills the ruins of the house occupied by Mr. Hillhouse, who lived many years among the Indians and, next to Dr. Hancock, gave England the first geographical accounts of British Guiana, which constituted the immediate inducement for my brother's travels.

864. As Mr. McClintock could not let me have the paddlers who had brought us here, and as none of the residents of the Morocco wanted to accompany me, I was obliged, after a four days' stay, to proceed up stream alone with Stöckle and my coloured men, and hire some people at the first Warrau settlement. Both banks consisted almost exclusively of the beautiful white blossomed *Calyptranthes obtusa* Benth. In isolated spots the tree-like bush really appeared as a tree some 30 feet high: its wood possesses unusual hardness, and is known in Guiana under the name of Cowaco.

865. As we reached the itabbo I hardly recognised it again, its surroundings having taken on quite another aspect. The large sheets of water whence bush-thickets, and larger and smaller oases, as well as *Mauritia* palms emerged on the occasion of my first visit had also, like the pretty blossoms of the *Crinum*, entirely disappeared. Cutting grass and ferns, particularly *Blechnum angustifolium*, *Aspidium gongyloides* and the white flowering *Rhynchanthera dichotoma* covered the dried flats and a thick felt of *Nymphaea* leaves the scanty bed of the itabbo, so that it was only with the greatest exertions that we were able to break a way through; the thermometer reached 89° in the shade. Dripping with perspiration and exhausted we reached that picturesquely situated village surrounded with glorious fruit-trees, which I stopped at on my return from the Orinoco when on my way to the Morocco Mission Station (Vol. I., Sect. 615). Desolation and silence reigned in the settlement and not a living being was to be found in it, but everything was still in the same condition as when I left it—the plates, bottles, glasses, etc., in the house of the dead chieftain were only covered with a thicker layer of dust, although sure signs were not wanting that the

settlement was still inhabited. For we were just about to sling our hammocks when we found our feet and trousers covered with thousands of sand-fleas which made us beat a very hasty retreat.

866. At Kuamuta mouth, which opens into the itabbo we met an Indian who told us that there were several Warrau settlements in the forest along the banks of the creeks. The innumerable tree-trunks which had fallen over and into the little forest stream soon made it impossible for us to proceed up the Kuamuta farther with our large corial, whereupon our informant hastened ahead to the village of the same name, and we soon saw the head of the settlement nearing us with several corials. The chief, Henry, is known to all the Colonists of the Pomeroon. On informing him of my purpose to engage a few paddlers from among his people, he seemed quite satisfied about it, but explained that this was not possible for at least four days because one of the villagers had just died and none of his people would come with me until the customary drinking-feast subsequent to the burial, had been celebrated. Forced by necessity I had to resign myself to the inevitable. My things were packed into the small corials and, in between a real labyrinth of over-turned and interlocked trees, we soon reached the village which was also surrounded with big clusters of bambu. The Warraus, like the Caribs, call the bambu Kuamuta, the name by which the village as well as the stream is known. The village consisted of 16 houses and upwards of 100 inhabitants. The passionately distressful lamentation proceeding from one of the buildings indicated the house of mourning, and several Indians were just then digging the grave. When the digging was completed, the corpse was wrapped in the hammock in which it still lay and then placed in a sitting position. After all his goods and chattels, as well as bread, fruits, and dried fish had been tucked in around and his faithful hunting-dog slaughtered and placed close by his side, the earth was filled in. When this was about half done, the widow and deceased's sisters jumped into it and forcibly stamped upon the newly thown-in earth amidst continued cries of grief. A fire was lighted on the little mound where it was kept burning several days, and around which the widow and her female relatives squatted. During this affecting exhibition of grief, I saw no tears fall. It has already been stated that the Warraus are convinced of the immortality of the soul.

867. Soon after the interment all the other remaining women betook themselves to the provision fields and returned with huge loads of cassava and potato, which were now as speedily as possible made into bread and prepared for paiwari. A large corial which, in addition to the usual paiwari trough, served as a reservoir for the dirty drink, contained with the latter about 600 gallons. Neither the widow nor relatives took part in these preparations, but sat in a circle around the grave and ever started afresh with their song of lament, which ran something like this:—

868. Why have you left your wife, your children and friends who loved you so dearly? Why have you left your house, and your field where the yams and cassava were thriving so splendidly? Who will now

hunt aguti and monkey for me, and catch fish and turtle for me? The last strophe would be sung in a heart-rending voice, the next would be sung in a more wailing and imploring tone: "Oh, Yawahu,* you have taken him from us by force, otherwise, he would never have left his field and his own people. Bring him back to his friends, those from whom you robbed him, so that he may hunt aguti and ape, and also get yam and cassava. Who is going to hunt aguti and ape? Who is going to catch fish and turtle for me?"

869. On the second day subsequent to the burial, the captain and the oldest people decked in festival attire, left the village, to invite the neighbours to the feast while the Hoho-hit with his scholars was already practising the requisite music with a noise truly deafening to one's senses. Among the instruments, I learnt to know of a new one, made of burnt clay, which was hollow, and had a peculiar shape that resembled an 8: both ends were open, one of them being provided with a sort of mouthpiece. The sound generally resembled that of our night-watchmen with their fire horns.

870. The Indians came trooping in next morning dressed in holiday attire, some of them clothed in a cotton shirt, and all the scenes which I had so often witnessed were enacted anew. As the Warraus commence their drinking-feasts before midday, I did not at least lose my sleep on that score. The lamentation of the widow and the relatives formed all the more glaring a contrast with this wild orgie. Already by afternoon, the most furious fights broke out among the drunken women with whom nails and teeth took the place of weapons. So long as the men were in full possession of their faculties they managed to separate the intoxicated furies and tie them up tight in their hammocks where they let their tempers find an outlet in taunts and screams.

871. A peculiar custom among the Warraus is that the widow and children left behind become the property of the brother or nearest relative. If the widow objects, the provoked blood-relatives revenge themselves by thronging into her house and giving her a most unmerciful thrashing, as the result of which she obtains her liberty to live with him whom she herself has chosen.

872. Among the many tamed animals, as monkeys, parrots, and gallinaceous birds, the most interesting to me was a pet glutton (*Gulo vittatus*). To protect the young poultry from its murderous lust, they had tied it up. Its food consisted of flesh, fish, raw fruit, and cooked yams. *Gulo Allamanda* is also found on the coast, and only differs from the *G. vittatus* in colour. The pelt of the back is dull black, a pigment, that on account of the white tips of the hairs, gives it a mixed colour. The snout, the lower jaw, throat, and parts of the body are on the other hand a shiny black: a whitish stripe shows itself between the eyes, over the ears, and along the sides of the neck. In a tamed condition they shew a marked aversion to water.

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* Foot-note Sect. 453, Vol. I. (Ed.)

† These double-bellied clay trumpets are still met with amongst the Warraus. (Ed.)

873. In company with three Warraus of whom one spoke tolerable English, I left Kuamuta on 7th October and continued my journey along the itabbo. The water had become so shallow that we had to shove the boat along most of the way which, with a temperature of 88° F. in the shade, was more than tiring. *Calyptranthes obtusa* still continued to border the oases. We finally reached the Kamwatta and soon after that the Barabara, which flowed along in between a forest shade of green so dark that the sunshine could only pierce it in a few places. I soon entered the realm of orchids because from the trunks and branches of the giant trees there soon smiled at me the fantastic blooms of *Maxillaria, Oncidia, Pleurothallis, Zygopetalum,* etc., amongst which neither the pretty white-blossoming *Ornithidium album* Hook. nor the beautiful *Coryanthes* was wanting. Amidst this varied plenitude of flower, we proceeded into the Beara, on the left bank of which we found several shelters for travellers (*Reischütten*), which we heartily welcomed because we knew by experience how difficult it was to find a dry spot in which to pass the night: these structures were built on a platform several feet above the ground. While engaged in making ready for our night's lodging, a countless swarm of *Cassicus viridis* Vieill. pursued its garrulous and noisy course through the trees over our heads. These birds also stick together after the breeding season and cross the forests in search of fruits. The enchanting notes of the *Cyphorhinus cantans* which found echoes in every bush woke me out of a deep sleep: it was just as if one wanted to tell the other that the early morn was already dawning, and that it was also time to begin the day's work. By daybreak we found to our astonishment that we were completely surrounded by water which had reached the floor of the house: the washing tide was still so marked although 15 nautical miles distant in a straight line from the Waini mouth. The commencing ebb bore us through stately palm-forests rapidly down the Beara into the Barimani, and Waini. The waters of the Waini, even at its junction with the Barimani, proved so salty that we were unable to drink it, and hence mangrove and curida-bush likewise constituted the vegetation of the banks.

874. We followed the Waini upstream and after searching in vain until sundown for a dry place to camp at, we finally put into one of the many small creeks on the right bank, along the rising slopes of which we found after a while a suitable and dry spot. The night was one of the most racking that I experienced in Guiana, because the thick swarms of mosquitoes punished us to distraction. Lying down was quite out of the question: indeed even the smoke in which we enveloped ourselves by heaping green timbers on the fire, could not scare away the bloodthirsty devils. The whole of our bodies next morning was bitten and swollen.

875. The banks of the Waini retained their monotonous character. In the course of the forenoon we passed the mouth of the Moribo which, as is known, forms an excellent connecting channel with the Barima. About four miles farther on, it is joined on the eastern bank by the Canyaballi: two miles higher up on the same shore, the Great Canya-

balli junctions with the Waini, while the Barama, which we now followed, flows into it here from the west. The width of the Barama mouth amounted to 150 feet. During its course, the Barama divides the isthmus between the Barima and Waini into two almost equal parts. The water had now lost its salty taste, the curida bush gradually disappeared and again made room for a varied vegetation which also extended along the banks of the Waiwa flowing here from the S.W. into the Barama. The Waini is occupied by Warraus, the Waiwa by Akawai. The banks of the Barama soon reached a height of six feet. A large number of the interesting *Triplaris americana* Linn., the dangers of which I was soon to be made painfully acquainted with, were always to be found on the sandbanks which the Barama usually formed in its many bends. In many respects this tree resembles *Cecropia peltata* a good deal, and often attains a height of from 60 to 80 feet: it has never yet had an exhaustive description given of it, because neither Aublet nor Jacquin mention its interesting bracts. The calyx of the male flower is six-sepalled, and not 3-sepalled as those botanists say, whence I must conclude that both never saw the male flowers and without waiting described it from the female ones. Strange to say they mention equally as little about the intense pubescence within the calyx in both sexes. The male blossoms wither already by the second day: the same is also the case with the corolla of the female, while the segments of the calyx continue to grow, and in their growth pass from green into red. The fruits, which the funnel-like calyx protects, overtop their size at least four times, and on that account give them quite the appearance of a shuttle-cock. I thought it was covered with white, green, and red flowers, in between which the green leaves of the tree were hardly noticeable. The peculiar internal structure of the trunk and branches makes the tree one of the most dangerous. These are completely hollow and divided throughout by equidistantly-placed horizontal partition-walls, in which it also resembles *Cecropia peltata*. The intervening spaces are chosen as a dwelling by one of the worst kinds of ants (*Cryptocerus*) of a yellow-brown colour, with a lanky body, and having the antennae situate in the middle of the projecting portion of the head. The mandibles are three-cornered and like the whole genus of *Cryptocerus*, are only used for holding fast onto the object which the insect then wounds with the peculiar sting on its hairy posterior.

876. Ignorant of the inner structure of the tree as well as of its dangerous occupants, and in spite of the warning gestures of my Warraus, I was trying to break off one of the branches when thousands of these insects tumbled out of the small rounded openings which they always eat away between every two of the partition walls. They regularly covered me, and in the greatest exasperation seized my skin in their mandibles, vomited a whitish fluid, and dug their dangerous weapons into my muscles. We now had in our corial not only the ants occupying the piece removed, but also the thousands tumbling into it from the

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1. Cf. Robert Schomburgk: "On the Ant Tree of Guiana (*Triplaris americana*)" Annals of Natural History, Vol. I, p. 264.

opening in the broken-off branch, because the shaking up of the tree had put the whole colony in a state of excitement. With a few strong strokes of the paddles, we got the boat out of reach of the tree, and in the next minute, every man jack of us was in the stream, the only way to escape their furious onslaughts. Even some tame monkeys and parrots did not remain free from their attack: the former, frantically tugging away, burst their ropes and jumped after us into the river, although they are animals most sensitively timid of water. After the bite of the *Ponera clavata* that of this yellow-brown species is the most distressing: the swelling, the inflammation and the pain remain visible and sensible for several days. The Warraus call the tree Ipuahari, which as much as signifies Ant-tree: the Arawaks speak of it as Yacuna, and the ants as Yacuna sae: the Caribs know it as Itassi, whereas the Colonists, owing to its lanky growth, have applied the name "Long John" to it. After emptying the boat with a good deal of trouble and many a painful bite, we resumed our journey. I must admit that a secret shudder always seized me as soon as we came across one of these trees.

877. The farther we followed the river the higher became the banks, the stronger the current, and the ranker the vegetation. Judging from the spots laid bare through breaking away of the banks, these consisted of a 3 to 4 foot high layer of mould resting on a reddish clay that gradually took on a pure white and greenish colour: this was followed by a thick stratum of sand down to the water level. The huge *Mora* trees were regularly covered with orchids, *Tillandsias,* luxuriant *Aroids*, the roots of which hung straight down to the water like a ship's rigging: many of these roots had a length of from 50 to 60 feet. Associated with them were *Bignoniae*, *Passiflorae* and *Aristolochiae*, while along the river-edges the *Cuphea Melvilla* Lindl., ornamented with its large beautifully coloured blossoms, flourished in a splendour such as I had never yet witnessed. A glorious *Strychnos* with its large leathery shining leaves and fragrant smell attracted my attention: it was new, and in honour of the celebrated chemist, Mitscherlich, I called it *Strychnos Mitscherlichii.** The *Cassia latifolia*, the big blooms of which for the most part break their way direct out from the bark of the trunk and branches like the *Theobroma,* likewise afforded me an equal amount of interest. The so delicately-shaped white aromatic flowers of the *Mimusops Sieberi* DeC. spread their fragrance through the air. The Indians are passionately fond of the sweetish fruit of this *Sapotacea,* which seems to be distributed over the whole of British Guiana: when ripe, they think nothing of going a 2 or 3 days' journey to fetch it, but as the trees that cannot be climbed unfortunately get cut down when they bear a crop, this must reduce their number considerably. A botanical discovery just as valuable for me was a *Caesalpinea,* in fact, two new species of that very interesting genus *Cynometra, C. Schom-*

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* The foot-note giving its technical description, in Latin, is omitted.—(Ed.)

burgkiana Klotzsch, and *C. guianensis* Klotzsch: the foliage of the pretty trees was regularly buried under the mass of fragrant white blossoms.

878. The banks of the stream, as it rolled along on its steady sinuous course, soon reached a height of 20 feet, but on account of being washed away underneath were in many places collapsed, and their vegetation slung into the river, a catastrophe that in isolated spots threatened to take place any instant. With the banks at this height, large masses of sandstone shewed up in the river-bed which the water had honeycombed like a sponge.

879. It was now the 15th October, the 11th day since leaving Kuamuta, that we had neither met a single human habitation, nor seen a human being. Our provisions were consumed, and yet I wanted to honour my King's birthday, which I had celebrated the year before in Torong-Yauwise amongst such a numerous assemblage of Indians, when I had been still able to toast His Majesty's health in wine from the fatherland. To-day I could only drink it in the pure water of the Barama. Late in the evening however we came across three woodskins with Akawais who were taking a trip to the Waini, and from whom, for the sake of somewhat celebrating the occasion I bartered two land-turtle which would be cooked when we camped. These people told us that it would be four days before we should reach a settlement.

880. We spent the night in one of the travellers' shelters (*Reise-hütten*). I had tied my two tame monkeys onto the roof, and was just sitting inside busily putting away the plants collected during the course of the day when they raised quite a piteous scream outside. I recognised the cause of the trouble as soon as I got out. One of those frightful labaria snakes (*Trigonocephalus atrox*) had just crept out of the palm-thatch and was staring steadfastly at the terrified creatures that perfectly well knew and felt the danger threatening them. Even when I held the dead snake up to them, the poor brutes still shewed extreme fear.

881. Both in the early evening and throughout the night we frequently heard on the Barama the equally very strange croak of another tree-frog (*Hyla palmata* Daud.) which, on this very account, is called "Paddler" by the Colonists, coloured people, and Indians. The note which it utters in short regularly measured intervals is so like the noise resulting from the stroke of a paddle that we were often enough deceived. Boat-hands, after every stroke of the paddle, strike the edge of the corial with its handle, whereby a peculiar hollow sound is produced, and supposing the corial, contain 6 to 8 or 10 of a crew, one nevertheless always only hears one rhythmical blow in which, however, the knocks of all the paddles are distinct though succeeding each other with lightning speed. It is by this noise that the approach of a boat, while yet a considerable distance away, can be recognised, especially at night. The favourite haunt of this frog is the bush hanging immediately over the water into which it jumps if pursued but which it leaves immediately after, to climb again up onto the bank or onto the twigs that dip the surface.

882. Next morning the river came from more out of a north-easterly direction in connection with which several isolated thickly wooded hills rose on its right bank. The Warraus called them Lalempo. A day's journey farther and we had arrived at the first Akawai settlement, Pirisana, with about 30 of a population. The greater part of the men were away on a trading expedition. About half a mile further up on the opposite shore was Cariacu, the Carib settlement, the spot that my brother had reached on his walking-tour from Manari on the Barima. We only remained in Pirisana long enough to satisfy our hunger with fresh cassava-bread, and then went on to Cariacu. The left bank on which the village stood was so steep that we could only reach it with a rough ladder. Here also I found only the chief and the female residents at home. The former was a sensible and intelligent man who received me friendly, and gave me the largest of the houses to put up in. The Barama still had a width of 60 yards, and yet in spite of this my host assured me that I could not push on any further with my boats owing to the overturned trees and rapids, and that for the same reason it was only navigable from now onwards by woodskins which, on account of their lightness, could be transported over such obstacles without much difficulty. The beautiful *Brownea* flourished here to an extent only comparable elsewhere on the banks of the Barima. Amongst the denizens of the neighbouring forest the large lizard *Podinema Teguixin* Wagl. very frequently caught my eye: this is the "Salompenter" of the Colonists, the flesh of which very much resembles that of the Iguana. It is an especially shy and quick creature. When at rest, it usually holds its head up in the air while at the same time it keeps continually shooting out its tongue: as soon however that it finds that escape to its secure dwelling is no longer possible, it shows a bold front, bites, and bravely lashes round with its 2 to 2½ ft. long tail. The Salompenter is found more plentifully on the coast than in the interior, where it is far from being welcomed near fowl-coops, because it eagerly snatches up not only the eggs, but even the young poultry. I frequently found its eggs, which are of the same size as the Iguana's, in the large globular nest of a termite which I came across not only in the forests but also on the stumps of felled trees on the estates, built about 2 to 3 feet from the ground. The Salompenter hollows out these ant-nests, eats up their builders and then lays its 50 to 60 eggs inside: it breaks the circular entrance through it always close to the trunk, so that on climbing up the stump it can slip in with ease.

883. The news of our arrival drew a number of Akawais occupying the upper Barama and its environs, to Cariacu where they came with provisions, particularly plenty of fowls. The Akawais are essentially distinguished from remaining Indians on account of their robust and compact build of body, and their darker reddish tinge of skin: they are, at all events, a fellow-tribe of the Caribs, as is shewn not only by their language but also by their warlike and enterprising nature. I have already stated that they are the real trading class of Guiana. As each looks upon himself as master, their chief exercises but nominal authority, and only an extra strong character can enforce recognition

of, and obedience to, his orders. Quarrels within the tribal community are of the rarest occurrence, though before Emancipation and on account of their trade with slaves, they were, next to the Caribs, the most feared of all the tribes. Equally celebrated as their courage and valour is their hospitality to all strangers, and their provision-fields, which are planted during the wet season, are accordingly up to twice as large as those belonging to other Indians. At the beginning of the dry season they form big caravans for their trading expeditions to Georgetown, where in return for hammocks, dogs, parrots and such-like they receive cash, knives, axes, powder, etc., which they again barter with the tribes of the interior for hammocks and so on. They usually travel for two days at a time, and then rest the third which they utilise at the same time for fishing and hunting to secure supplies for the next two. To satisfy their thirst for revenge they mostly employ the Wassi, which they barter from the Serekongs. Besides on the Barama and Barima one finds settlements of Akawais (Wakawais, or Waikas) still on the Demerara, Mazaruni, and Potaro. The whole tribe might number about 700 individuals. Their religious convictions correspond entirely with those of the Caribs. As the old Carib chieftain was in need of a large knife, I managed to swap him one for his magic rattle, an exchange that had to be effected however with the greatest secrecy. Profane eyes must never gaze upon these rattles, and that is why they are always kept wrapped up by the Piai.

884. The harbingers of the small rainy season had already put in an appearance, and if I still wanted to push on to the Orinoco mouth and replace the sea-fish that had been lost in transit to Berlin, I had no more time to lose.

885. What with the rapid current we were already back at Barimani mouth four days later. Before reaching it we came across a huge drove of small birds, mostly *Nectarinae*, *Tanagridae* and *Fringillae* which were flying along the bank in one and the same direction from tree-top to tree-top and searching after insects: the crowd was several miles long. Arriving at Timiti mouth, a small forest stream on the eastern bank of the Waini, we followed it up a bit to visit a Warrau settlement, situated some distance away from the bank. The village consisted of 12 houses, which showed more cleanliness than I had ever before seen among this tribe. An interesting sight was a tame kinkajou or Night Monkey (*Cercoleptes caudivolvulus* Ill.) which on account of its rapacity was tied up by one leg. The Warraus called it Uvari. It slept throughout the day: its activities began only at night. Daylight appeared to be particularly painful to its eyes, and if it were waked out of its sleep by mischievous boys, who knew its weakness, and put out in the sun in front of the house, its eye-lids remained in a continual state of blinking, while its movements became slow and awkward. Its behaviour, however, proved just the opposite when brought back into the somewhat darker house, although its liveliness lasted but a short while, as it soon lay down again to sleep. The food placed before it, which consisted of sweet fruits, it would only devour after darkness had set in when, like the *Nasua,* it carried it to its mouth in its forepaws. Being great lovers

of sweets, kinkajous often make raids on the bees' nests, when their thick fur protects them from being stung. Besides fruits they also devour small mammals, birds, and insects: they are found more frequently on the coast than in the interior.

886. The banks of the Waini from here down had assumed quite the character of a coastal stream and with inward dread we again found ourselves enclosed between mangrove and curida bushes, and heard the dull humming of innumerable mosquitoes. In the course of the afternoon we passed the mouth of the Luri which flows into the Waini from the East and as we were unable to find any dry place on the swampy waterside to land at, had to continue our journey during the night. The silence was only broken by our groans over the bloodthirsty mosquitoes, the noise of the howling apes and the wandering troops of *Callithrix sciurea,* or the splashing of the scared water-fowl. During the night we proceeded past the mouth of the Buruwaiwini, which is about 6 miles from Luri and also flows into the Waini on the same shore. Some distance below its mouth, the bed of the Waini suddenly broadens out into three large lagoons and then just as suddenly returns to its original width. The third of these lagoons, which is situated about 2 miles from the estuary, presents a sheet of water certainly 2,000 feet across. Towards midday we got to Waini mouth and the well-known shell-bank lay in front of us. The most active life now reigned here, numbers of corials were crossing the mouth backwards and forwards, and houses rose on the barren flats over which the glorious red ibis and the white egret were winging their flight. But I hardly recognised our old camping-ground again: the whole shape of it had altered so much. High breakers were now rolling in on where we had pitched our tents, and where we used to catch our fish, waterfowl of all kinds now strutted up and down along the moist ground. The whole bank was changed and where before we had hardly noticed a 2 to 3 ft. low mangrove bush, we were now confronted with a 16 to 20 ft. high forest. Still more altered however than the outward configuration of the bank was the life that we now found occupying it, considering that at least 200 Indians were gathered on it and that corials were arriving and leaving for the purpose of receiving and taking away the quantities of dried and smoked fish as well as the numbers of baskets filled with crabs. Even whole families of coloured people turned up to spend so favourable a time here fishing, and to dry and smoke the spoils. Amongst the Indians I soon recognised many an old acquaintance from the Barima and Aruka.

887. In spite of the strong sea-breeze the air was nevertheless regularly vitiated with the cast off and decaying bits of fish. Hook and net were in continual use. A large sheath-fish, Killbagre of the Colonists, would be particularly caught with the former: the tasty Querriman (*Mugil liza*) in the latter. According to the statements of trustworthy men, the gullet of the former, like that of the Lau-lau, forms a haven of refuge when danger threatens for the young fry that are ever swimming around their mothers' head: Dr. Hancock thus relates that a large Killbagre, on being caught and brought to land, spat out from three to four

hundred young ones. Besides several other interesting fish I got hold of *Chelichthys psittacus* the Wurwurima of the Indians, who maintained that its bite causes death. From what the Warraus told us, the Akawais prepare one of their deadliest poisons from this fish, by drying and powdering it up fine. I have several times mentioned how little or how much reliability can be placed upon the statements of Indians relative to animals being poisonous or innocuous. The peculiar *Aspredo tibicen* Tem., *Bagrus proops* Val., *B. mesops* Val., *B. Passang* Val., and *Galeichthys Gronovii* Val. were very frequently caught on the hook.

888. The husky screech of innumerable waterfowl, such as *Ibis, Platalea, Ardea, Charadrius, Numenius, Scolopax, Larus,* and *Rhynchops,* resounded in the air almost all the day and night through. Swarms of small sandpipers ran at topmost speed in one direction close in shore, and owing to their colour corresponding with that of the wet sand, were only perceptible when the oncoming billows forced them either to alter their course or rise—in short, the animated coastal scene, altering with every second, again unfolded itself before me in its entirety. With nightfall hundreds of beautiful frigate-birds (*Tachypetes Aquila* Vieill.) flew over the sandbank, but always out of gunshot. It is a grand sight to see these big birds with their pretty forked tail as they fly along with ease, rapidity, and grace, and watch how skilfully and simply they combat the biggest storm, remaining at a standstill in the air often for minutes at a time, and then, with the swiftness of an arrow, suddenly swoop down into the water after a fish. As these birds flew over the sandbank every evening I do not doubt but that, owing to the absence of all rocks and rocky islands in British Guiana, they pass the night on the trees in the neighbouring forest. They do not have to nest in Guiana.

889. The small rainy season had now set in and a fresh attack of bad fever forced me to turn back without being able to see the Orinoco again. After an eight days' stay I proceeded up the Waini richly laden with spoil. We were delighted to welcome Barimani again, because after two weary days and nights it was the first to offer us a dry spot where we landed and were able to stretch our cramped limbs, and pass the night.

890. On the following day we reached the Beara and, soon after that, the Asacota, which I had to enter: the fever shook me up so violently and mercilessly that I found myself forced to look out for the Arawak settlement of the same name situated on it. We managed to shoot one of the beautiful large Mahookas or Horned Screamers (*Palamedea cornuta* Linn.) at the water-side here. Although the bird seems to be distributed over the whole of Guiana this was the first specimen I had seen: nevertheless I had often heard its peculiar noisy note in the forest. The Indians do not eat its flesh—I do not know for what reason—and only use its large tail-feathers for their arrow-barbs. From what the Indians say, it builds its nest on the ground in swampy woodlands. I saw a second specimen later on in Georgetown which strange to say had been shot there in the garden at the Seamen's Hospital, and must have evidently flown too far, because the *Palamedea* is one of the shyest birds

of Guiana, and avoids occupied areas. The horn on its forehead, as well as the longer or shorter somewhat curved spurs seen on the anterior part of the wing gives the large bird a striking appearance.

891. My old friend Caberalli was away. I did not have to regret this short stay of eight days because it gave me the opportunity of witnessing a hideous, nevertheless highly extraordinary death ceremony which is also customary among the Muntrucus. It was a bloody death-dance called the Mariquarri after the whips plaited out of the fibres of *Bromelia karatas* which are used thereat. After every death, this dance is celebrated by the family of the deceased at an interval either of several months or a year. The body with the usual wail of lament is laid either in a hollowed-out tree-trunk or a small corial, and buried in the house. From the day of death onwards, the cassava fields of the deceased must not be used, because the festival is celebrated when the roots have begun to ripen, and the paiwari required for it has to be prepared from them. The acquaintances and friends in the neighbourhood are invited for the date appointed by sending a knotted-calendar round to them. As the day breaks, all the men of the village take up their positions in two rows in front of the house, and provided with these whips, lash every arrival with all their might across the calves: no blow must fall above or below these. The arriving guest does not in any sense seek to avoid the whipping, but in a challenging attitude quietly puts out one leg in front of the other. Those thus welcomed now join the rows of the whippers, and then treat subsequently arriving guests in the same fashion, until all are assembled. While this has been going on the filled calabash never rests. A general whipping amongst themselves now begins. It was an awful sight when the blood soon streamed down the swollen calves, and complete strips of skin and muscle hung from their slashed limbs—wounds on account of which they had often to lie in their hammocks for weeks, before they were again healed.

892. After the whipping had been going on for a while, the combatants arranged themselves in procession, at the head of which were carried three figures representing a crane and two human beings: they thus went round and round the house in which the corpse lay buried, chanting a long monotonous dirge. When the song was ended three men armed with knives suddenly made their way in between the former whippers and forcibly attempted to wrench the lashes dripping with blood out of their hands and immediately cut them up. In the meantime, outside the house, there was dug a grave in which were placed the cut-up whips, after the struggling for them was all ended, the three figures, and all the deceased's utensils and weapons that were still to come to hand. With the filling in of the grave that now follows, all remembrance of the deceased is destroyed. With owners of extensive cassava fields these bloody death-festivals will be several times repeated, because the Manihot of a dead person may only be used for the paiwari on these occasions. Where such repetitions take place the cut-up whips are carefully preserved, and put aside for each feast next following, and the ceremony of burying them only performed on the last

occasion. The man who is not seen to take a conspicuous part at the festival, has no claim to drink of the paiwari. When I made enquiries from the people as to the object and motive of the ceremony, they knew of none to give me. Their forefathers had buried their dead in this fashion, and so they buried theirs in the same way. All my efforts to obtain some of these blood-soaked whips as well as one of the figures were in vain: I barely succeeded in bartering some of those that had not been used.

893. I have already mentioned that the Arawaks differ in many ways in their manners and customs from remaining tribes. Most different of all are their tribal divisions, the whole tribe, like the Caribs, being divided up into families. According to Hillhouse, who lived amongst them for a long time, and who took an Arawak woman to wife, the whole tribe consists of the following families:—Maratakayu, Wunesido, Korobahady, Ebesuana, Queyurunto, Demaridi, Wurallikady, Dakamokaddy, Aramukungu, Nebetitady, Karuafuddi, Baboana, Siwedey, Bakurukaddy, Kanahea, Irobalina, Euboquaddi, Maikoweyu, Haduadatunha, Wakuyaddi, Karabanury, Beorybetody, Ehbenselio, Warirobaquadi, Aramkritu, Kariwhiti, Eubotaddi.*

894. The caste or genealogy is retained through the mother and with the most scrupulous care. No member of any one family is allowed to marry another of the same. The children of the father who belongs to the family of Wurallikady, are according to the rules just mentioned not Wurallikady, but, if the mother belongs to the family of Dakamokaddy, are Dakamokaddy, and as such can marry quite properly into the Wurallikady, but not into the Dakamokaddy.

895. With respect to the lying-in ceremonies, they correspond entirely with those of the other tribes: the man keeps them up at the same time as the wife.

896. In connection with marriage ceremonies they differ but slightly from the others. Supposing the young Arawak wants to set up his own establishment, and provided he has chosen among the daughters of his own tribe, he negotiates secretly with the girl's relatives, and assures himself beforehand that he will not meet with a refusal. When he knows this, he pays a visit to the girl's parents, tells them how poor he is, that he has no wife, etc., whereupon the father with a lot of pretty phrases gives his sanction. If the bride, on completion of these preliminaries, places some food before the young wooer, she expresses her consent: he eats what is put before him and the marriage is concluded. In the evening the mother slings the young girl's hammock near that of her spouse. If a father is specially anxious for some particular person to be his son-in-law he lets his daughter put some food before him when he pays a visit, and if he eats it the marriage is concluded: but if he leaves it untouched, the old man knows that the wishes on both sides are not in agreement. If the girl is so young that the bridegroom has still

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* Other Arawak families are known and recorded. There is a strong suspicion that certain of the other tribes were similarly divided into families, *e.g.* Warraus on the Moruka group themselves according to the rivers in the Orinoco basin from which they believe they originally came. (Ed.)

some years to wait, he will in the greatest number of cases be given by his father-in-law, a widow, or an older unmarried girl out of the family, who after the marriage with the real bride withdraws to the status of a servant.

897. It has been previously stated that the women get their hair cut after the death of their husbands, and also that they must not remarry until it has once more attained a certain length. When the time arrives the nearest relative of the deceased has the first claim on the widow. Supposing somebody else wants her, he must buy her from the former for a gun, a corial, or some other object. If someone marries her without the consent of the rightful heir, this mostly becomes a cause of sanguinary strife. It follows from what has been mentioned that polygamy is almost generally indigenous.

898. The chief can claim the services of the family of his wives when circumstances demand it: in return for this, however, he is bound to participate in all their quarrels, to avenge injuries offered them, and to board them in his own quarters in time of drought, etc. It often happens in such cases that his supplies are completely consumed and he finds himself forced to go, with his immediate family, to relatives or friends living more remote, on whom he lives until his cassava fields get new crops. Blood revenge is practised by the Arawaks to its utmost extent.

899. In Asacota, I became acquainted with one of the most interesting animals of Guiana, a night-monkey (*Nyctipithecus trivirgatus* Spix), the Durukuli of the Indians, as a tame domestic animal. It was the first specimen I had ever seen in the course of my stay: I saw a second one on my return to Demerara with my friend Stutchbury, who had bought it from stranger Indians. It is a pretty queer sort of animal and shuns light just as much as the owl and bat: its small round head, enormously large yellow eyes, and short little ears give it a curiously droll appearance. If the Kinkajou (Sect. 885) made grimaces when during the day it was disturbed from sleep and brought into the light, the very troubled and helpless movements of the Durukuli aroused our downright compassion. By day the Durukuli is almost absolutely blind: it staggers around like a blind man, and clasps the first convenient dark object, onto which it presses its face so as to escape the painful effects of the light. Its favourite spot during the day was the darkest corner of the house, or the huge paiwari trough under which it lay in a regular torpor, out of which it could only be awakened by several smacks. But the shades of night had hardly fallen, than the sound sleeper came forth from out of its lurking-place, and now no more mischievous or funnier a creature could be found. It went from hammock to hammock, usually licking the hands and faces of the sleepers lying inside: from the ground it climbed to the topmost rafters, and what was not fixed firm enough was usually found lying about on the ground of a morning. By virtue of the length of the hind limbs as compared with that of the front ones, the Durukuli is a most accomplished jumper. The capers that I noticed in the specimen at Asacota were exactly repeated in the one at Mr. Stutchbury's. It was curious how the animal, after pitch-

ing its playground under the table of an evening, would clamber up to us, and then, as if it had suddenly gone mad, bound back again directly it saw the lighted candles standing on top of it. Its eyes shone much brighter in the dark than do those of the cat tribe. Although the Durukuli, like the monkeys, is fond of everything, its favourite food would seem to be little birds, a taste that it shewed at Mr. Stutchbury's where, already on the third night, it had taken a bird out of its cage. My brother only came across one specimen on his previous journey and this had been found by an Indian in a hollow tree. Its intolerance to light, as well as the dark hiding-places where it spends the day, seems to me to be the chief reason why the animal is to be so extremely rarely seen. The fur is much thicker than that of the other monkeys, and is also somewhat woolly. Its geographical distribution appears to extend over a large portion of South America. Although I offered the Arawaks a considerable price for the animal, they did not want to part with their pet: they had bartered the pretty creature from the Akawais to whom it had been brought by the Macusis.

900. On the day after the Mariquarri feast, when the participants were still lying sick and intoxicated in their hammocks, I left Asacota and continued my journey up the Barabara. The first target for my gun was a large *Labaria* snake. On cutting open the swelled body, a number of 3 to 4 in. long young ones swarmed over me, all of them still possessing their yolk-sacks. and so contradicting the statement that the young slip out of their eggs only at the moment of birth: this at least is not the case with *Trigonocephalus atrox*.

901. After being overtaken, during the course of the afternoon, by two boats with Venezuelans from the Orinoco who wanted to go to Georgetown, we reached by evening the mouth of the little forest stream Kuamuta. We were just steering into it to spend the night at the settlement of the same name when we noticed some Indians in the village, not far from its mouth: the village, surrounded with fruit-trees, from which the sandflies had driven us away six weeks before (sect. 865). I altered my plans and landed there. Just as I jumped on shore the very first thing to catch my eye was a red uniform that had been spread out on a bench placed in front of the buildings, so that it could be seen by everybody travelling over the itabbo. Henry, appointed head over the Warraus of Kuamuta and its environs, came towards me, bade me welcome, and led me to his temporary residence. Since the Governor had promoted him to the chieftainship of all the Warraus in this district, he pitched his camp now sometimes here, now sometimes there, and just at present was living at this picturesquely situated settlement. I had hardly stepped in the big house with the dusty glassware, etc., than he fetched a much rolled-up package from out of a well-locked trunk, and on undoing the many wrappings of paper, pieces of calico and dried plantain leaves, produced the Governor's official warrant, and held it before me with a proudly triumphant look. He had also received the uniform at the same time, and so that every passer-by should know who was living there, it was spread out on the bench, when not in use, just like one is accustomed to fly the flag on a

palace when its princely owner is in residence. Above everything else Henry had undergone a wonderful change, because with his uniform he had set up a regular royal household, for he now deemed it beneath his dignity to sweat for his own support. He had his hunters, fishers, etc., whom he paid every month with articles of trade. Although he had bought complete European clothing for his pretty young wife and beautiful daughter, they had to do all their work just as before. During the course of my whole trip, I only once noticed a similarly regal retinue, and that was at Chief Caberalli's, and he certainly also possessed both warrant and uniform.

902. To my great joy I learnt through Henry, who had met Mr. McClintock shortly before, that my brother had arrived safe at Georgetown a few weeks previously.

903. Though late, and a good while after having turned into my hammock, I was awakened out of my beauty sleep by loud talking and plenty of noise, and without really understanding what it was all about, soon sank into slumber again. It must have been 4 o'clock in the morning when I was again wakened by the loud conversation of one single voice: I had surely already heard it often before, and yet at the first moment could not make certain whose it was. At last I found my man, without being able to see him on account of the darkness prevailing: it must be that indefatigable talker Clementi from Warina on the Barima (Sect. 497, etc. Vol. 1.) On calling his name, his "Matti, matti," told me I was not mistaken, but to keep him quiet was now a matter of absolute impossibility.

904. After daybreak we continued on our way and without further difficulties reached Morocco Mission where, it is true, I did not find Fr.. Cullen, but instead of him, the key of his provision-cupboard which the good-hearted missionary, with the prescience of our early arrival, had kindly left at my disposal. Everybody here was still upset at the attack of an immense snake on two of the Mission inmates. An Indian had left here a few days before to go up the river with his wife after wild fowl. A frightened duck had been shot and fallen onto the bank. As the hunter hastened after his bird he was suddenly seized by a huge Comuti snake (*Boa murina*). In want of any weapon of defence, he having left his gun in the corial, he called to his wife to bring him his large knife. Hardly had the woman reached his side than she also was seized and encircled by the monster, a movement that fortunately afforded the Indian just sufficient space to free one arm, and inflict several wounds on the beast which, weakened by these, finally let go its hold and sought escape. This was the one and only instance which came to my knowledge of a *Boa murina* attacking a man.

905. Owing to my Warraus not wishing to accompany me farther, they being afraid that no opportunity might be forthcoming of getting back to Kuamuta from the Arabian coast, I was forced to go on next morning alone with Stöckle and the coloured men. At the mouth of the Morocco I met my friend McClintock from whom I received definite news of my brother's safe return.

906. McClintock came back to his station with me; we reached his quarters just as safely as we covered the distance between the Morocco and Pomeroon mouths. Without being disturbed at night by the mosquitoes, I took my departure next morning, reached Pomeaco, where I gathered up the things that had been left behind, and on the following day arrived at Plantation Anna Regina. After a three days' rest with my friend Hughes to recover my strength, I boarded the estate's schooner to Georgetown where I arrived after an absence of four months, richly laden with spoil, and found the news of the arrival of my brother's expedition absolutely confirmed.

907. In the following chapter I am submitting a short summary of the ethnological and geographical results obtained on this very important journey of his.

CHAPTER XII.

Return of my brother from the sources of the Corentyn—Results of this Expedition—Taruma Settlements—Barokoto Indians—Maopityans or Frog Indians—Waterfall of the Onoro—Basin of the Amazons—Caphiwuin—Settlement of the last of the Maopityans—Mt. Karamuzin—Cataracts of the Caphiwuin—Zurumata Indians—Junction of the Wanamu with the Caphiwuin—Kaphu—Basin of the Wanamu—Indian Hieroglyphics—Cataracts of the Wanamu—Watershed between the Amazons and Corentyn—Pianoghottos—Junction of the Curuni with the Cutari—Cataracts of the Corentyn—Waterfall Frederick William IV.—Path of Don Francisco Jose Rodriguez Barata between the Corentyn and Essequibo—Return to Georgetown—Excursion up the Demerara—Floating grass-flats—Donacobius vociferans—Nectandra Rodiei—The Chain of Sandhills—Fauna and Flora of the Same—Golden Hill—Bends of the Demerara—Kashwima Hill—Vultur papa—Tributaries of the Demerara—Granite Masses—Rapids—Ororu Mallali or Big Fall—Topographical and Statistical Remarks concerning British Guiana—Return to Europe.

908. My brother and his party left Watu-Ticaba on the morning of 3rd June but were obliged to leave a large proportion of their provisions behind, owing to several of the Indians who had promised to accompany them, absenting themselves. On the following day they entered the virgin forest and soon crossed a small stream that flowed into the Guidaru. The terrain consisted of rolling ground which here and there was covered with quartz and granite boulders. Towards noon they reached the last settlement of the Atorai. It comprised a moderately large round house in which were slung not less than six hammocks, all of which were occupied. Thick bushes of *Bixa Orellana* and slim palms (probably a *Euterpe*) with a thickness of 19 inches at the base of the trunk and a height of 100 feet, surrounded the house. According to several circum-meridian altitudes of *gamma* of the Great Bear and *alpha* of the Cross the position of the house was 2° 18′ 24″ lat.N. The meridian distance from Pirara amounted to 21 miles East.

909. They continued their journey on the following day, cut across the river Dohté, one of the largest tributaries of the upper Guidaru, and soon once more struck innumerable granite boulders which, like those just mentioned, stretched from North to South. They reached the Carawaimi Range about 1,000 ft. high with its highest peak about 2,000 feet, lying to the east of it. Continued rain forced them to pitch their tent already by the afternoon.

910. After cutting across several bambu thickets on the 6th June they stood on the bank of the Guidaru, which here had a width of but 20 feet. On the opposite bank they had to wade through numerous swamps, which were thick with a species of cacao (*Theobroma bicolor?*): the trees, for the most part, were 50 feet in height and their seeds for

several days to come supplied them with the most delicious morning drink. The large fruits usually enclosed 60 to 70 seeds, which were certainly larger than those of the cultivated tree, but not so thick. Soon after noon they reached a Daurai settlement, which my brother had already visited on his journey to the sources of the Essequibo in the years 1837-8. Though six years had barely lapsed since he had known this settlement as a village with 40 residents, his party had already now to fight their way in to the ruined houses with an axe. The inhabitants had died down to two adults and a few children, but these last survivors of a once extensive tribe had abandoned the disastrous place. The same was the case with a Taruma settlement they had hoped to reach on the 8th. The Cuyuwini lay in front of them, but the houses which the settlers had erected anew on the other side had disappeared. The Tarumas seem to devote themselves a good deal to the cultivation of sugar-cane of which they offered my brother considerable quantities for barter. The want of carriers forced the party to stay here longer than they had intended, because the places of those required had first to be filled. During the period 13th to 15th June the thermometer in the sun rose to 132° ; in the shade at 1 o'clock it registered 91.2°. According to 28 circum-meridian altitudes of northern and southern stars, the position of the village was 2° 4′ 30″ lat. N. and 58° 40′ 4″ long. W.

911. Fifty-six thermometric and barometric readings that were taken during their stay gave the following results:—

Instrument.	Mean.	Highest.	Lowest.	Remarks.
Barometer	Inches 29·270	12th June 11.30 a.m. 29.316	14th June 6 a.m. 29.191	The greatest difference on one and the same day amounted to 19·3 degrees for the thermometer and 0·118 inches for the barometer.
Attached Thermometer	degrees 79·68	13th June 11.30 a.m. 90·8	10th June 10 a.m. 70·3	
Thermometer Dry Bulb	79·92	91·2	70·5	
Wet Bulb	76.92	83.7	69·6	

The evaporation of the water on 12th June, from 6 a.m. to 6 p.m. amounted to 252 grammes in the 1,000, *i.e.* equal to 2.52 mm. or .098 inches in 12 hours. Das Resultat von 100 schwingungen bei 88½° ergab am 13 Juni 2m. 535,08 p. La, und 3 m. 425 bei 90° p. Lb.*

912. The village was quite surrounded with woodland, the nearest savannah some 30 miles northerly. According to Bunten's barometer it was situate 745 feet above sea-level.

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* I have given the sentence in the original, it being unintelligible to me. (Ed.)

913. On the 18th June they went on by water in two small corials and six small woodskins: the whole party numbered 23 people. Although the river was full to overflowing, the current was very insignificant. Palms, among them *Astrocaryum* and *Euterpe* in particular, some forest trees, the trunks of which were covered with *Brassavola Martiana* Lindl., *Zygopetalum rostratum*, *Epidendrum variegatum*, and here and there with a *Brassia*, formed the vegetation along the banks.

914. They had to proceed on the two following days in almost continuous rain, till on the morning of the 21st, when they reached the Essequibo: the bed of this stream was also full to overflowing, as a result of which its current had increased from 1 mile to 3, so that it was only with the greatest efforts that they could make their way up. On the 23rd, after paddling from 6 in the morning to 6 at night without stopping, which meant that they had to fast all day, they reached the longed-for Taruma settlement, consisting of two houses, the greater portion of whose occupants however were unfortunately away on a fishing trip. Fish caught by the Indians who had stayed at home, and the finest bananas stilled their nagging hunger. They were also offered large quantities of sugar-cane, the greatest portion of which had a thickness of 8 in. circumference, with the septa generally 7 to 8 inches apart

915. On the 25th they resumed their journey, but could only make slow headway on account of the strong current. This night might easily have proved the last for my brother, because, while sitting in the evening under the tent with Mr. Goodall, he felt something cold creeping around his feet, and before he could make out what it was his fellow-traveller had already jumped up with a yell of "Rattlesnake." The least movement of one of his feet would have brought my brother to his grave.

916. On 27th June they reached a second Taruma settlement on the Essequibo, already visited by my brother in 1837, where they were received with doubled rejoicings, because the residents were just celebrating a paiwari feast. The corial that served as a bowl was 22 feet long and 3½ ft. wide: close to it stood a large trough 15 ft. long, 2½ ft. wide, and 1½ ft. deep. My brother struck up against another old acquaintance here on his previous journey, the Barokoto chief Yarimoko. His two former wives had died, and were replaced by two others of whom the younger could hardly be 14. The dance which followed after sundown differed but little if at all from that of the remaining tribes.

917. The accounts received here concerning the Corentyn proved to be extremely contradictory. Yarimoko garnished them still further with all kinds of stories of evil water-spirits and awful monsters, and when he saw that these exercised no influence upon the party, he put in review the terrible Indian sorcerers, the hostile character of the tribes and the absolute want of provisions. Just as it was once the case with Columbus, so it happened with my brother, that by prophesying a partial eclipse of the sun, he made Yarimoko so friendly that the latter promised to accompany him to the Maopityans or Frog Indians where he could make further enquiries about the Corentyn which he called

Curitani. To get the necessary provisions prepared he soon set off ahead of us for his village.

918. The Taruma tribe still numbers about 150 individuals who are diminishing year by year. Their dread of mixing with other tribes—for the marriage of the Barokoto Yarimoko with two Taruma women was one of the rarest exceptions—and the unequal proportion of women to men whereby duties are mostly imposed upon the former before arriving at maturity, make a numerous and vigorous progeny almost impossible, while the children resulting from the even as yet undeveloped mothers generally live but a few days or remain weak and sickly throughout their whole life. All these facts must conduce to their complete extinction as surely as smallpox and other diseases have already done with other tribes.

919. It seemed surprising to my brother that the Tarumas called an eclipse of the moon piwa-toto, which is a compound of piwa, the moon, and toto the earth. Is it a guess, or do they know that the earth is the cause of the darkening of the moon? As on our previous journey my brother tried to get hold of some skulls and was not a little astonished when Yarimoko readily fell in with his proposition to let him have the crania of both his wives, his child, and his mother-in-law. To allay suspicion from the Tarumas he insisted however that my brother should remain behind and that only Mr. Goodall should accompany him. Judging from the younger wife's skull she could have been barely 10 years of age: her bones lay in a woodskin, in which was also found a bottle of water, so that she should not suffer thirst on her way to the other world. Close beside her grave was that of her child, her mother, and her fellow-spouse.

920. When the Barokoto was asked by Mr. Goodall to show him the grave of a Taruma Indian, he objected, because he did not possess the right over them that he had over the others with whom he was connected by marriage. My brother had never yet been received by any Indian tribe with such devoted hospitality as he was by the Tarumas.

921. From 40 circum-meridian altitudes of *alpha* and *beta* Centaurus and *gamma* of the Great Bear the position of the village was 1° 43′ 58″ lat. N. and according to the chronometer readings 58° 20′ 51″ long. W. Its absolute height was 767 feet. 81 meteorological observations, which were taken by day between the 27th June and 8th July, gave the following results:—

Date.	Instrument.	Mean.	Highest.	Lowest.	Remarks.
1843 from 27th June to 6th July.	Barometer	Inches 29·248	29th June 9 a.m. 29·341	6th July 6 p.m. 29·166	The weather was changeable, frequent thunderstorms and dense mist of a morning. Light breeze from E. by S. and E. by N.
	Attached Thermometer	degrees 75·11	30th June 1 p.m. 80·60	28th June 6 a.m. 67·28	
	Thermometer Dry Bulb	75·22	80·60	67·00	
	Wet Bulb	73·92	77·20	66·00	

The greatest variation on one day amounted to 12.8 degrees.

922. On the 8th July they struck camp, Yarimoko joining the party with the whole of his household—men, women and children, dogs, parrots, etc.: a boat had been despatched some days beforehand to the Maopityans, in order to pick up the provisions that had been got ready at his village. In the course of the day a peculiar sickness befell one of the young men. His tongue and gums began to bleed so profusely, without any apparent cause, that within a short time he fainted: the blood streamed most actively from a spot where a molar had been extracted many years previously. It was only subsequently that the hemorrhage was stopped with the help of warm vinegar: the patient was so exhausted next morning that he could hardly move.

923. On the day following they reached the mouth of the Urana, where they left their woodskins, to travel on land. The expected Maopityans not having put in an appearance, they were obliged to leave a portion of their baggage behind. Next day a loud barking indicated the approach of strangers and, shortly afterwards their messengers and 14 Maopityans stood in front of them. The latter differed essentially both in build of body and in attire from all other Indians that my brother had become acquainted with during the course of his travels. Although their height quite corresponded with the other Indians, their figure if more slender was nevertheless more bony than that of the Tarumas. Their head was compressed laterally, and their facial expression, on account of the lustrous eyes, brighter. They wore their hair tied up into a long tail carried in a 10 to 12 inch sort of cone made of palm-leaves from which a number of strings with the most variegated feather-attachments fell dependent. Amongst them were four women who wore in each ear a rounded piece of bone from which feathers connected to strings likewise hung down. The men had stuck 2-inch long pieces of bambu in their ears and the cheeks behind the corners of the mouth were pierced by little sticks also decorated with feathers.

924. After the first salutation ceremony, the arriving Indians readily went off to the mouth of the Urana to fetch the baggage that had been left there.

925. During the 11th and 12th July the road ran straight towards E.S.E. It led over ranges of hills, 100 to 150 ft. high, which alternated with swampy valleys. The latter were occupied by *Mauritia aculeata, Oenocarpus Bataua, O. Bacaba, Astrocaryum murumura, Irartea exorrhiza, Euterpe* and innumerable *Scitamineae.* Next morning they crossed the small stream Onoro, which falls into the Essequibo, and followed its valley until they pitched camp at the foot of a mountain. The distant noise of falling water indicated the presence of a cataract, which my brother in company with Goodall and some of the Maopityans visited by evening. The Onoro shoots over a steep precipice from a height of 100 feet down into the valley that they had been following till now.

926. On the morning after, they climbed Mt. Zibingaatzacko, crossed the Onoro again, and thence continued their journey up hill and down dale over mountains and heights. *Mauritia flexuosa* covered the valleys.

Many of their trunks reached a height of over 100 feet before spreading their beautiful fronds, which my brother all the more wondered at because, like myself, except in the environs of Roraima he had hitherto only found the palm on the savannahs, and here the height above sea-level already amounted again to 1,200 feet. Besides this, the majority of the specimens of *Mauritia aculeata* were from 50 to 60 feet high.

927. After crossing Mts. Honicuri-yiatzo and Kabaiokitza, they struck the first stream, in a small narrow valley, that flowed into the Amazon River. The absolute height of the valley was 1,130 feet: the real watershed between the basin of the Essequibo and of the Amazon lay still 120 feet higher. The small stream was the Caphiwuin or Apiniau, which receives the Wanamu and then, in conjunction with it, forms the Kaphu, the Trombetas of the Portuguese.

928. As in the morning so it continued over mountain and dale till they crossed Mt. Kenukawai and reached the valley of the Darura, the first tributary of note of the Caphiwuin. After an uninterrupted march of 5 miles they arrived at the provision fields of the Maopityan settlement, which consisted of two large bee-hive houses: on the tops of these there rose a second smaller bee-hive roof from which hung several flat pieces of wood shaped into all kinds of figures that were swayed backwards and forwards by the wind. It was only with fear and trembling that the women ventured to put out their hands to welcome the new-comers. The two houses lodged the last remnant of the once powerful tribe of the Maopityans or Frog Indians. The larger of the houses with a height of 100 feet, and a diameter of 86, had at its centre a strong post which they called Aiyukuba: it was covered with a quantity of Indian figures and hieroglyphics.

929. On account of the lateral compression of the head, which is in no sense produced by artificial means, as my brother was able to convince himself in the case of a new-born infant, their faces are unusually long, with the result that the whole head simultaneously becomes smaller circumferentially than among the remaining Indians. The back of the head appeared among the men to be almost vertical towards the top: the frontal bone was but small, the cheek-bones on the other hand sharp and projecting, while the great distance from ear to ear was especially striking.

930. Iron seemed to be still totally unknown to them: bone took its place. They also possessed a kind of arrow-poison which, however, did not prove as effective by far as that of the Macusis. In addition to the "pig-tail," part of their festival-attire consists of a kind of arm-band of palm-leaves, also painted with hieroglyphics, which is slid onto the upper arm. Beneath this arm band are stuck the blue Macaw tail-feathers, with their quills down, so that their tips reach to another 5 or 6 inches above the head: this gives the dressed-up Indian a more than grotesque appearance, to which the moustache-like finery in the cheeks contributes a good deal. They seem to cultivate but little cotton because only their apron belts are woven of it, their hammocks on the other hand being plaited from the fibres of the young *Mauritia* leaves.

931. The total number of still living Maopityans amounted to 39, who together with some 20 Tarumas from whom they had chosen their chief, occupied the two houses. They call themselves Mawakwas, but the Wapisianas call them Maopityans from Mao, the frog and Pityan, the people or tribe.

932. Upon his enquiring about the Corentyn, my brother only learnt that, in order to reach the river Curuni (sect. 952) they must travel down the Caphiwuin to the mouth of the Wanamu, which came there from the North, but then, however, up the latter until they got to the settlements of the Pianoghottos and Drios, who lived in its neighbourhood. As the craft of the Maopityans only consisted of woodskins, which, however, were in a miserable condition for such a trip, the party had to build new ones for themselves beforehand. Out of the bark of a single Mararen tree (*Copaifera*) they were able to manufacture two woodskins, of which each had a length of 35 feet, and a width of 4 ft. 5 in. As the tree was cut down the balsam, which was quite white and transparent, ran out in such quantities that one could easily have filled several gallons with it: the Mayopityans anointed their bodies with it, but its medicinal properties were quite unknown to them. One of the trees close to the camp measured 125 feet from base to tip: the Mawakwa name for it is Yaru-yaru.

933. On the day after the arrival of the expedition two Mawakwas were sent off to inform the Pianoghottos of the arrival of strangers. The position of the village was 1° 25′ 18″ lat. N. and 58° 6′ 14″ long. W.

934. On the 18th July the woodskins were ready at the same time that the women had prepared as much cassava meal as the unfavourable crops of their fields permitted, and in company with six Mawakwas my brother left for the country of the Pianoghottos. The bed of the Caphiwuin being hardly 45 feet wide here, and full of granite boulders and upturned trees, they had in many places to struggle first of all with an axe to cut a way through. On the 20th July they passed by the foot of Mt. Yucawarin, about 1,500 ft. high. The mountain ridges ran mostly in a North and Southerly, or in a North and Westerly direction. The rankest vegetation hemmed in the banks of the Caphiwuin. *Isertia, Petrea, Posoqueria, Carapa guianensis, Tachigalia paniculata, Clusia insignis, Eperua, Bertholletia excelsa, Theobroma* and innumerable palms combined to form the most beautiful landscape, the background of which was enclosed by those equally thickly-wooded mountain ridges, that were soon to be associated with a long row of mighty waterfalls. On the evening of 20th July they had reached the summit of the Uwiya, the first important one of these falls.

935. On the 21st day they passed Mt. Karamuzin, which rises 2,850 ft. above the bank and in the evening pitched their camp close to the top of a new cataract formed of a perpendicular greenstone dam. Several 8 in. diameter and 2 in. deep excavations contained in these rocks were of especial interest. The position of the fall was 1° 23′ 23″ lat. N. Next day the squadron was already two vessels short, these having run up against a rock.

936. On the 23rd July the Wamaru Serrika Fall forced them to unload the boats and carry them together with the baggage along the banks, a labour that was only completed by evening. The height of the fall was 45 feet.

937. They had hardly proceeded a mile on the morning of 24th July when a new cataract soon followed by several others, though not so considerable, in rapid succession, forced them to commence afresh the wearisome work of yesterday. On the afternoon of 26th July they reached Karamutahura Fall which was especially conspicuous by the fact that the greatest portion of the water was carried away in a south-easterly by easterly direction in a 450 foot long natural granite aqueduct. The fall started twenty feet above the remaining portion of the mass of water, which had already at its commencement rushed down into the depths, and flowed on along the bottom of the aqueduct at the termination of which it joined the waters rushing down it from the cataract. The boats had to be let lown here with ropes. The party had hardly put a half mile between them and the Fall, when they reached the top of a new cataract where the current rolled over a sharply inclined mass of granite 1,500 ft. long and then rushed headlong over a mighty steep precipice, and boats had accordingly to be emptied again. The black Pacu was so plentiful here that within a short while they were able to kill 21, partly with arrows and partly with cutlasses.

938. According to barometric reading, the bed of the river was now 222 ft. lower than in the environs of the Maopityan settlement, so that the gradient was 4.4 (?) ft. to the mile. The position of the curious cataract just mentioned was 1° 20′ 50″ lat. N. and 57° 16′ 50″ long. W.

939. From the many tracks which they found next morning in the sand, jaguars must be pretty plentiful there. Towards midday they passed the mouth of the Camu (Sun River) which flowed into the Caphiwuin from the N.N.E.

940. On the 28th they finally struck again one of those fisherman's huts which the Indians are accustomed to build at spots where fish are plentiful. Since Uwiya (Sect. 934) this was the first, just as its environs seemed to be the "ultima Thule" of the Maopityans. A small fall, which however offered many difficulties to its passage, induced my brother to pass the night at its summit. They had hardly pitched the tent when at some distance away rising smoke indicated the presence of people in the neighbourhood. One of the woodskins was let down the cataract, and on paddling to the column of smoke they found a family of Zurumatas, a branch tribe of the Pianoghottos, consisting of a man, a young woman, a girl, and a boy: the latter were completely naked. Judging by his build of body, the man seemed to correspond entirely with the Maopityans except that, unlike them, he did not wear a pig-tail. The queyu of the woman was made out of seed-pips. They were just then returning to their home which was still 5 days' journey from here.

941. On the 29th July they reached the junction of the Wanamu with the Caphiwuin. The former comes from N. by E., while the course of the Caphiwuin shortly before its junction is entirely 81° E.: as a

joined stream they run E. by N. and the Maopityans and Pianoghottos call it now Caphu or Kaffu. The junction of both streams is in 1° 2½′ lat. N. and 56° 48′ 43″ long. W. while the barometric records gave a height of 540 feet above the sea. According to the reports my brother received, later, it seems to admit of no doubt that the Kaphu is the Trombetas, Oriximina, or Curuniz of d'Acuña, which in 1° 57′ lat. S. falls into the Amazon in the neighbourhood of Abydos. According to Martius, the junction is 451 Paris feet above sea-level, which at all events, in my brother's opinion, is given too high: this was also the case with the Barra do Rio Negro which Martius fixed at 522 feet, although Fort Sao Joaquim which lies almost 300 miles from there up the Rio Branco with its many cataracts, does not even reach this height. As I have previously remarked, the banks of the upper Trombetas, owing to recent discoveries, were assigned as the home for the Amazons, after they had been driven out of all the districts previously ascribed to them: nevertheless my brother enquired for them here also in vain, because even any tradition of their existence was foreign to the inhabitants of this area.

942. The Wanamu, up which they now travelled, had muddy yellow water like the Caphiwuin: the Indians called it Yau-uh in its upper course. Its current amounted to about 1½ knots an hour, in connection with which its bed was broken through by huge granite rocks. The mountains at the foot of which the river turned, reached a height of 300 feet only at particular spots: and yet the heat increased every midday all the more, although of a morning it seldom stood higher than 68°. The Curiau which came from the N.W. and was some 200 feet broad joined the Wanamu in 1° 16″ lat. N. Five miles farther up, my brother again found the first Indian hieroglyphs, since he left the Essequibo. He had sought for them in vain at the junction of the Caphiwuin: if a later traveller should discover them there they were now hidden by the high rise of water.

943. On the 3rd August in 1° 30′ N. the expedition reached the mouth of a river, the size of the Curiau, and as the somewhat stupid guide answered my brother's enquiry as to its name with an equally stupid "Ha!" he marked it under this name in his map. A few miles farther up they stood once more at the commencement of a complete series of wildly-roaring cataracts. Small hills of granite boulders heaped one over the other, on both sides of the rebellious waters, were covered with a wanton wealth of vegetation and constituted the sources of origin of the water-falls. The woodskins had to be emptied at several of these, and at the last one yet another of these craft was lost, which proved all the more grievous as it contained their last basket with cassava-flour. The largest of the falls was in 1° 33′ 30″ N. and 88 miles easterly from the settlement of the Maopityans. On the 5th August they again had to deplore the loss of a woodskin.

944. Eighteen days had now passed since they left the Maopityans. Hunger had already been their companion for some time, and the longed for Pianoghotto settlements would not shew themselves, when to-day, just as my brother's woodskin was turning a bend of the river, they saw

a corial with two Indians coming down stream. But hardly did the latter see them than they altered their course and fled precipitately. My brother could not overtake them. The same thing occurred with two other Indians in a corial. Several other corials in a small inlet indicated the landing-stage of a settlement, but which they found all its residents had quitted. Their fright had apparently been caused by the four men, whose tidings of the coming of strange people had spread alarm and fear, because the inhabitants had left their entire possessions, even their hammocks, behind.

945. Although my brother immediately despatched two Maopityans to convince them of the peaceful intentions of the newcomers, and at the same time gave the strictest orders that nothing of the residents' property was to be tampered with, they returned without having attained their object: they had not found the fugitives. Judging from the 8 to 10 cutlasses, several new axes, knives, and scissors all of Dutch manufacture, the village must be in brisk intercourse either with the Surinam Indians or the Maroon Negroes.

946. At nightfall a Wapisiana gave my brother the information that the Maopityans had concocted a plan of leaving the settlement during the night with the property of the owners and leaving the expedition to its fate. All firearms were loaded without delay, the rebellious Frog Indians were locked up in one of the houses and distinctly given to understand that anyone who tried to escape would be immediately shot. In spite of the most stringent watch three of the prisoners nevertheless made their escape. At daybreak it appeared that they had already removed everything portable during the evening before. These had to be restored. The chief and the guide were retained as hostages, but the third one was let go with the threat that if the stolen goods were not returned by evening both these men might be shot, but certainly would remain prisoners until he and those who fled during the night succeeded in getting the fugitive Pianoghottos to return.

947. Within the course of an hour the stolen things were back again in the settlement, and the three fugitive Maopityans on their way to bring back the Pianoghottos. During the next few days it was made clear by several signs that people on the watch were prowling round the village at night and yet all search for them proved in vain. Finally on 13th August one of the scouting parties returned with the news that they had met several Pianoghottos on the River Iriau and that they were coming up the river with the Maopityans. It was the same Zurumata family that the expedition had already met at the mouth of the Wanamu. They had gone from there to some Pianoghotto settlements where the fugitive villagers had soon arrived with the news that the dreaded Tschikiana Indians were coming up the river. The Zurumata, convinced that they had mistaken the white men for them, had already signified his intention of paying them a visit, whereupon eight Pianoghottos joined him and they would be arriving next day.

948. They looked out for the latter in vain on the 16th August, and as my brother now knew where to find them, he determined upon going there himself. According to 84 circum-meridian altitudes of

the southern and northern stars, the position of the settlement was 1° 40′ 5″ lat. N. and 56° 30′ 19″ long. W. The village lay 753 feet above the sea. The mean of the meteorological observations gave the following results:—

Time of Observations.	Instrument.	Mean.	Highest.	Lowest.
7th August to 15th August	Barometer	inches 29.258	7th August 10 a.m. 29.341	8th August 6 p.m. 29.216
	Attached Thermometer	degrees 81.39	8th August 2 p.m. 91.56	14th August 6 a.m. 66.92
	Thermometer			
	Dry Bulb	81.47	92.00	67.00
	Wet Bulb	77.05	82.9	66.5

949. When about to depart on the afternoon of 16th August, the party found that not only the Zurumatas, but five of the Maopityans had disappeared: the remaining one seemed ready to follow suit. After proceeding another ten miles down the Wanamu, they turned into the Iriau, the current of which was broken by a number of drifting trees and rapids. On the 18th August they again came across the Maopityans who had followed them by land. During the 19th three of the Maopityans again left them clandestinely, so that my brother found himself forced to leave behind his baggage,—except the instruments and a few other indispensable articles,—because the land journey commenced here, and the faithful Macusis and Wapisianas were not in a condition to carry more. The valuable collections that my brother had made on his trip from Watu-Ticaba are still lying there.

950. Crossing onto the left bank of the Iriau, the path led over mountains and through swamps which were thickly occupied by *Euterpe* and *Oenocarpus*. On the 21st August they met the first river that flowed to the N.N.W.: with that, they had left the basin of the Amazon. The hills forming the dividing range were hardly 150 ft. high. In a few minutes' time they stood in front of a deserted house, the position of which, from the observations taken, was 1° 49′ lat. N.: they had accordingly crossed the dividing range in 1° 48′ 30″ lat. N. and 56° 30′ long. W. The height above sea level was 794 feet. It was evident from several signs that the house must have been occupied only a short while before.

951. After crossing the Aramatu on the 23rd August and continuing their way through swamp and over hill, they hit on a camping ground that could hardly have been left an hour before: half an hour later they reached a Pianoghotto village where they were awaited and welcomed by the athletic and well-built inhabitants. In their costume they quite

resembled the Maopityans: indeed, so much care had been spent on the pig-tail that it would have done credit to the most fashionable Parisian hairdresser. The body was not decorated in lines, but with the exception of the face, was painted red from chin to toe. The men wore plenty of beads around the loins and shoulders and, like the Zurumatas, below the knees cotton strings from which a number of tassels were dependent. Around the neck of each man a prettily made comb hung down upon the breast. The bows and arrows were unusually long: they did not possess war clubs. The women were far more niggardly fleshed by Nature than the men and wore the hair cropped quite short. The village consisted of three houses of which one exactly corresponded in its construction with those of the Maopityans: the two remaining ones were open sheds.

952. According to the reports that my brother was able to collect concerning the district, it admitted of no doubt that the Curuni or Curuwuini of the Pianoghottos was the Curitani of the Maopityans.* Their nearest neighbours to the eastward were the Cocoipityans or Harpy Eagle Indians and five days' journey farther the Mekurus or Maroon Negroes of Surinam. They carry on a lively trade with the latter.

953. On the 25th August the whole of the villagers set out to fetch the things the expedition had left behind. The three Maopityans, after receiving their pay, went back with them at the same time: just before leaving they were handed the wages for a fourth one, who on account of a bad foot had been unable to proceed. As the Pianoghottos could not get back under seven days, the interval was accordingly occupied in making new woodskins, and baking cassava bread because my brother wanted to continue his journey down the Cutari.

954. A few days after the departure of the residents, the expedition visited several of the neighbouring Pianoghottos from whom my brother was able to gather many geographical and ethnographical notes. To the East of the village the Orokoyanna or Parrot Indians are said to be living: towards S.S.E. on the banks of the Kaphu, the Tschikianas, the dread and terror of their peaceable neighbours: close to the sources of the Wanamu, some five days' journey from here, the Drios, a fellow-tribe of the Pianoghottos: farther towards the S.E. the similarly feared Maipurischiannas or Tapir Indians, who use the skulls of their slain enemies as drinking vessels. Towards the S.W. lies the country of the Tunayannas or Water Indians, and farther to the westward that of the Carawayannas, and Barakutyos or Barokotos. The direct Westward appears unoccupied. When my brother mentioned the names of Arawaks and Warraus, they pointed to the North.

955. On September 1st at least a portion of the baggage was brought to the village, and my brother determined to depart without further delay although the salt, tent-cover, and the largest part of the collections were wanting.

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*—*i. e.* the Corentyn, sect. 917. The Aramatau flows into the Cutari, and the Curuni into the latter soon after the junction, sects. 958, 959. (Ed.)

956. The meteorological records taken during the nine days' stay gave the following results:—

Date of Observations.	Instrument.	Mean.	Highest.	Lowest.
21st August to 1st September. 100 Observations	Barometer	inches 29.074	30th Aug. noon 29.139	29.028
	Attached Thermometer	degrees 80.82	29th Aug. 2.30 p.m. 90.44	65.12
	Thermometer Dry Bulb	80.96	91.40	65.60
	Wet Bulb	76.42	83.	65.1

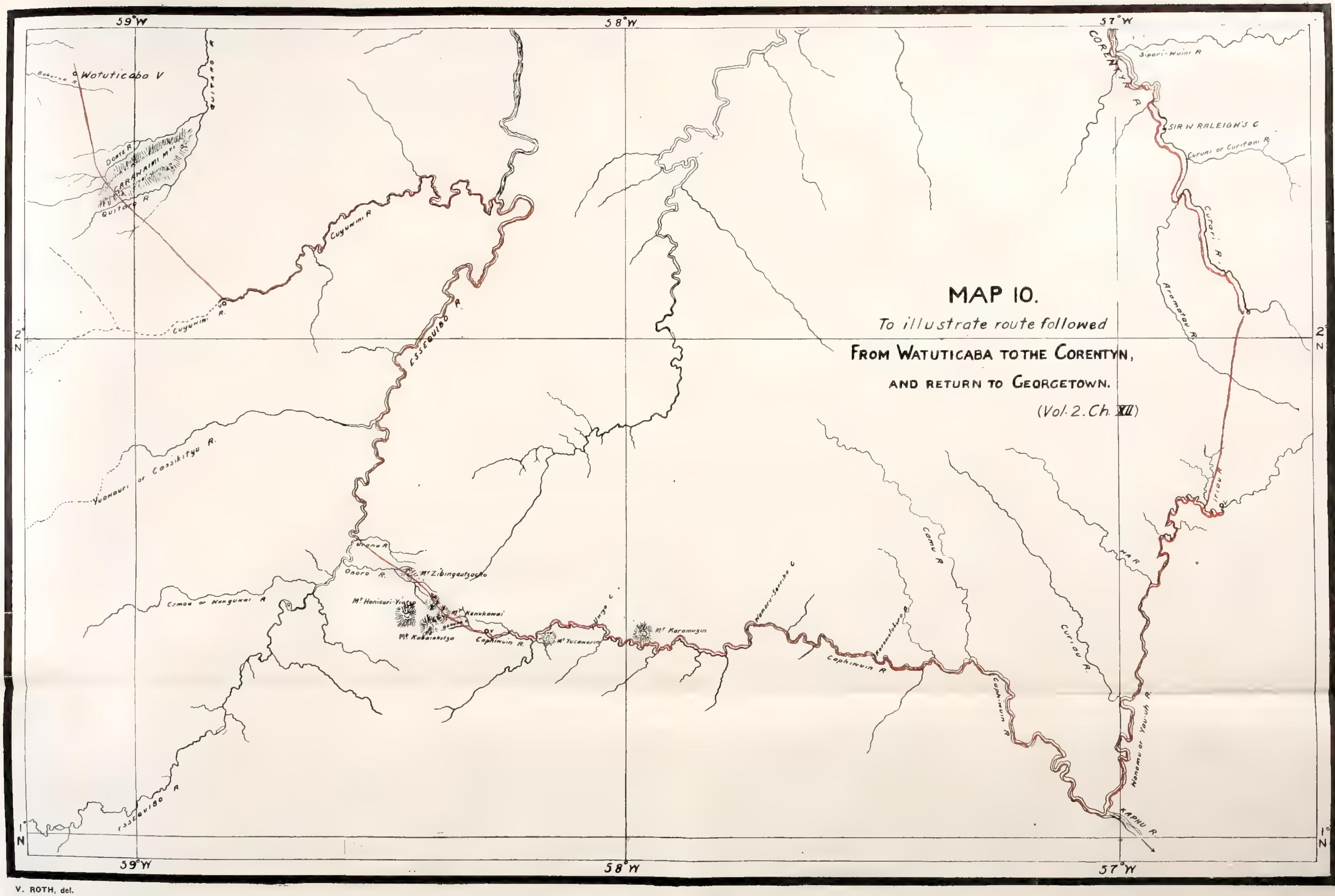
The position of the spot was 2° 3′ 36″ lat. N. and 56° 34′ 3″ long. W.

957. The next project on which they wished to embark was to visit a settlement of Drios on the Cutari. Except that the Drios, like the South Sea Islanders, tattoo the whole body, they exactly correspond in build and attire with the Pianoghottos. The position of the settlement was 2° 3′ 30″ lat. N. and 56° 34′ 39″ long. W.,

958. Midday on 6th September the five woodskins were packed and although the men-folk had already been tiring themselves out for the past two days in hacking a way through the trees banked one on top of the other, but slow progress was made. Every morning half the people had to be sent ahead, in order to clear the waterway at least somewhat. On 11th September they reached the mouth of the Aramatau, which they had crossed on 22nd August: the united stream, about 500 feet wide, now took a N.N.W. course.

959. Some two miles from the junction, there commenced the series of cataracts and rapids running in a N.N.E. direction, whereupon the river flows N.N.W. again, and soon afterwards receives the Curuni, which blusters down a considerably steep precipice where, joined with the latter, it immediately rushes over a huge granite dam. The Curuni was also unusually well provided with rapids, and came out of the E.S.E. The junction of both streams was in 2° 20′ 50″ lat. N., 612 feet above the sea.

960. The cataracts and rapids now followed one another in rapid succession. My brother named one of them Sir Walter Raleigh's Cataract because, projecting amidst the roaring waters near its base, was a huge rock of mica upon which the sun's rays seemed to visualise the picture of Guiana painted for Queen Elizabeth by Raleigh. At midday the temperature rose to 142° in the sun, to which they were exposed, because owing to the small size of the woodskins no tent-covers could be erected over them. The vegetation of the stream appeared to be un-



MAP 10.

To illustrate route followed

FROM WATUTICABA TO THE CORENTYN,

AND RETURN TO GEORGETOWN.

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59°W
58°W
57°W
2° N
1° N
Watuticaba V
Baberua R
Donte R
CARAWAIMI MTS
Quitaro R
Cuyuwini R
Cuyuwini R.
ESSEQUIBO R
Yuanauri or Cassikityu R.
Urana R.
Onoro R.
Camoa or Kangunai R
Mt Zibingaatzacko
Mt Honicuri-Yiatso
Mt Kenukawai
Mt Kabaiakitzo
Caphiwuin R.
Mt Yucawarin
Mt Karamuzin
Honaru-Sarriko C
Karamalahwa R
Caphiwuin R
Camu R
Curiou R.
Caphiwuin R
Wanamu or You-uh R.
KAPHU R.
CORENTYN R
Sipori-Huini R
SIR W RALEIGH'S C
Curuni or Curitani R
Cutari R
Aramatau R
ESSEQUIBO R

V. ROTH, del.

commonly uniform: orchids were wanting altogether. On the 14th September they passed the mouth of the Sipariwuini. The thermometer again rose to 135½°. Violent thunderstorms, that had already been setting in almost every evening for the past few days, had now considerably increased the height of the water of the Curuni. From the 18th September on, the river took a more westerly, often also a southern course, where the bed was broken by a number of islands, until by evening the party was again confronted with a series of dangerous cataracts, formed of a number of granite dams which crossed the river in a more northwesterly and northeasterly direction. In spite of the bark of the woodskins being no thicker than half an inch no accident had happened with them up to now—here however one had to be left behind because it had sprung aleak in coming down a rapid.

961. Below the series of cataracts, the river, covered with innumerable islands, widened out to 8 miles. Almost every channel between any two of these islands was a foaming waterfall: my brother accordingly named this part of the river "The Falls and Rapids of the Thousand Isles." The flora of the islands shewed little variation. *Elisabetha coccinea, Jacaranda, Laurus surinamensis, Clitoria arborea,* and a tree-like *Solanum* were its chief representatives. Orchids were likewise non-existent here. On the 19th September they camped in 3° 21′ 30″ lat. N. The provisions were already so diminished on account of the complete absence of mammals and birds, even fish being very scarce on account of the high water, that the daily ration had to be reduced to 4 oz. of farine.

962. On 20th September they reached the head of several falls, one of which had a 52 ft. perpendicular drop. The woodskins had to be unpacked and together with the baggage carried more than a mile over hills 150 feet high while the river, on account of the continuous falls and rapids, was so far entirely impassable. My brother named the above important one after His Majesty the King of Prussia: Frederick William IV.'s Cataract. Its position is 57° 29′ 54″ long. W. and probably 3° 26′ lat. N. The cloudy sky prevented any astronomical observations.

963. On the 22nd September the baggage was repacked at the foot of the lowest of the falls, so that the voyage down could be resumed. The river, owing to the numerous islands, had again increased in breadth. Gneiss dams crossed it in 3° 38′ 38″ lat. N. from N.N.E. to S.S.W., one following on the other like furrows in a ploughed field.

964. The journey up to the 24th September was only a repetition of previous days. At noon they had again reached a fall where, at the summit, they had to unpack the woodskins, and at the foot they found some ruined houses, two corials, and at the same time the path leading from the Corentyn to the Essequibo. These were the corials that belonged to a party of Caribs whom we met in March on the Rupununi whither they had come from the Marowini to visit their fellow-tribesmen. They had given my brother permission, if he should find their boats on the way, to use them as far as the Carib village Tomatai, where he was to hand them over to the chief, William. The track proved to be

of especial interest to my brother because it has apparently been known since the 17th century, the very one that Don Francisco José Rodriguez Barata twice followed. Lord Stanley's Cataract lies in 3° 59′ 16″ lat. N. According to barometric readings, they were now still 230 feet above sea-level, and many a cataract might still be awaiting ahead. After some hours the longest of the corials, which measured 40 feet, was packed, only to be unloaded again on the 26th on account of an important fall. Hunger continued to show its effects more and more visibly on the figures of the whole party. On the 28th day they had also to unload their vessels twice and convey them overland, and the daily ration still further reduced to 3 oz. of farine. New hopes, however, animated the crews as they came in the evening to the landing up to which my brother had made his way in 1836. With eight pounds of farine which had to last another four days, because they could not reach the Carib village before that, the company weakened by hunger and fever, left the last of the large cataracts. On 29th September the remainder of the farine was divided into 15 portions and distributed among the 15 members of the expedition. On the 1st October, after 26 days travelling down the Corentyn under difficulties and dangers, and without having met a single individul they reached the Carib village of Tomatai: here my brother was immediately recognised and welcomed by his old friend William, who in the meantime had become the chief. The steaming pepper-pot was soon set before the famished travellers. They reached New Amsterdam on 9th October, and Georgetown on the 12th.

965. Our larger expeditions were now completed, but my brother, and consequently I also, could not think of the return journey home. A ship just then leaving for London, took with her my dried plants, in short everything that had no life in it, while I went once more to Anna Regina to add to my collection of living palms those that are found so plentifully on this portion of coast. With the assistance and kindly solicitude of my friend Hughes, 40 different species were already planted in boxes within a few weeks: they throve splendidly. On this occasion I learnt by experience that no plant is so sensitive to the exposure of its roots as the palm: for unless I drew out the small often finger-long seedling with the greatest care and with plenty of earth, it grew no further: the *Euterpe* and *Guilielma speciosa* formed the only exceptions.

966. Several weeks were thus quickly spent in searching for palm seedlings and doing other botanical work, and if I still wanted to carry out my idea of taking a trip up the Demerara to the Big Falls, and making the most of its banks so rich in orchids, it was now time for me to return to Georgetown. The palms that I had planted were handed over to the care of my friend Hughes until our departure for Europe.

967. As Stöckle, immediately after his return from the Pomeroon had gone back to business and his expectant wife at Bartika Grove, and had accepted a billet as constable at the Penal Settlement he was unable to accompany me on my trip as I would very much have wished.

968. With my coloured men I left Georgetown on April 1st and travelled up the lively Demerara. What must immediately strike every stranger to the river are the large floating grass-islands which are

continuously being carried up and down, the sport of ebb and flow. This peculiar sedge-like grass, which had only become indigenous on the river a few years before from the Orinoco,* was brought here with the cattle with which the districts bordering that river supplied Georgetown, the beasts being fed on it during their transport by water. After the sale of the cattle, one usually threw the fodder that remained into the river. The flood had carried this up the stream where many a stalk, possibly still possessing its roots, and finding a firm spot to strike, multiplied uncommonly quickly and soon covered large areas of the water. These fixed resting spots are, however, only of short duration—the more these "flats" increase in extent, the easier are they ripped away again by the current and subjected to the play of the waves. As floating islands they then continue to live either a longer life or hit once more upon firm soil, to which they again attach themselves temporarily. Only a few of them reach the open sea with the ebb, because they are soon driven back into the mouth with the incoming flood. These wandering islands that lend a strange aspect to the stream, disappear beyond the limits of tidal influence. The grass has indeed already appeared at the mouth of the Essequibo, but up till now not to the extent that it has in the Demerara: it appears to be a *Panicum*, but I have unfortunately never found it in bloom, so as to determine the species.

969. After passing Number One and Number Two Canals, we reached Stanley's Town, a negro village in the course of construction that is spread along in between Musa and Coconut palms. A few miles higher is the mouth of the small stream Hubabu, which flows into the Demerara on the West. On the banks of the Hubabu was the establishment of a timber-getter with whom I wanted to put up for a few days to try if I could not find the blossom of one of the most interesting of the coastal trees, the Greenheart of the Colonists. Several Negroes had settled at the waterside near the mouth. After making our way through a thick forest, we came upon an open swampy savannah which had much resemblance to that on the Morocco. Streaked with high sedge-like grass the brush-wood of the small oases was alive with several *Donacobius vociferans* Swain. It is quite a peculiar bird. Directly it sees a human being, it raises its loud rattle of a cry, resembling that of a reed-bunting, whereupon all its mates tarrying in the neighbourhood come near and while continuing to fly upon and off the bushes, join in the identical note: as soon as the individual is out of sight, they silently disperse in all directions. The bird builds its nest among the sedge and brushwood. I have never come across it in the interior. With every stroke of the paddle I became more convinced of the destruction that can be caused by a forest-fire on these richly-timbered flats. The mighty giant-trees with their black half-charred trunks and bared branches now rose above the recently shot-up dense undergrowth and made a mournful impression on me, accustomed as I was to seeing the

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* Known as Freeman's Grass on the Demerara River. (Ed.): also described as Musuri or Missouri Grass (V.R.)

rankest vegetation. The second-growth differed in many ways from that on the Morocco, because it consisted only of *Vismia, Psychotria, Piperaceae, Melastomaceae,* and other small dwarf-like bushes which, however, formed an almost impenetrable thicket that was spun over with a number of creepers. Although the forest fire had taken place more than twenty years before, no four-footed creatures had been found here since. I was assured that this remarkable phenomenon was repeated wherever a conflagration of that nature had once banished them: as substitutes, the lifeless trees that consisted for the most part of *Caryocar tomentosum* had become the playground of innumerable woodpeckers, the hammering of which sounded over the entire flat. The most plentiful were the red-headed *Picus comatus* Ill., *P. lineatus* Linn. and the small black *P. hirundinaceus* Gm.: the latter rushed from tree to tree with constant cry. *Lanius cayanus* Linn. seems to choose the holes made by the former for hatching, because I saw these birds busily engaged flying into them with the building-materials required for their nest.

970. Towards evening we reached the place and were received by the proprietor with the usual West Indian hospitality: and by next morning I already had my wishes fulfilled: the greenheart was in bloom. I found that the tree belonged to the genus *Nectandra,* and to a new species, which in honour of Dr. Rodie, the discoverer of the medicinal properties of the bark, was named *Nectandra Rodiei* Schomb. Dr. Rodie make known his results in the year 1834. Dr. Douglas MacLagan of Edinburgh, who obtained a piece of bark for more accurate investigation from Dr. Watt, a friend of his in Demerara, published the results of his analysis in the Transactions of the Royal Society of Edinburgh Vol. XV. Part III. Dr. MacLagan succeeded in separating from the alkaloid in the bark a sulphurous acid salt, which not only in England, but also in Guiana, shewed exactly the properties of quinine. Unfortunately, according to the calculation of Dr. MacLagan it cannot be manufactured under 6 shillings the ounce, an amount only exceeding the present day cost of quinine by a shilling, but as no medicine varies so much in price, the discovery always remains important enough to make use of should the occasion arise. A second trial was made by Dr. Sachs, assistant surgeon in the Royal Charité, Berlin, with a quantity of bark, which I took with me for the purpose. An infusion was prepared from the already 3-year old bark, and used in 6 fever-cases with such good results that 4 of the patients were quite cured of their complaint: the attacks returned in only two cases.

971. What with its glossy-green leather-like leaves, the tree, mostly 60 to 80 feet high, is one of the most beautiful ornaments of the coastal forests, and I was all the more delighted that out of the many seeds which I took with me one has germinated in the hot-house of the Court Printer, Mr. Decker in Berlin: under the excellent care of the gardener, Mr. Reinecke, it is now flourishing quite soundly as a pretty little tree. I have already mentioned how much its hard timber is sought after in England for ship-building.

972. After an eight-day stay with my friendly host I returned to the Demerara, the banks of which, beyond Hubabu mouth, continued to

display an uncommonly lively landscape. The negro village, Mocha, nestles very sweetly on the left bank: pleasant little houses are surrounded and shaded with luxuriant coconut and cabbage-palms. The residential quarters and boiling houses of the plantation onto which the village joins lie immediately on the Demerara waterside. The smoking stacks of the sugar-mills, the flourishing green coffee plantations with their often three-storey-high drying houses, the numerous boats ploughing along the water, and a road raised high and dry along the banks, with a number of branches inland, everywhere proclaimed the enterprising spirit and busy hand of man. The dark green hem of *Rhizophora*, *Avicennia* and *Laguncularia* which bordered the waterside was only wanting at the wharfs and landing places of the different estates: it was at such spots alone that a glance over the luxuriantly growing cultivation flats with their waving fields was rendered possible.

973. For 70 to 80 miles up the river continues navigable even to larger loaded ships and here runs fairly parallel with the Essequibo. Number Three Canal branches off on the right or easterly bank. Some miles above this we reached Chantilly Island, to be soon followed by two others. Convicts sentenced in Georgetown are buried in the former, and accordingly have still to make a considerable journey after death. Only one of these islands, Borselen, is in a state of cultivation and planted up with plantains. Here was formerly the seat of Government, *e.g.*, the Courts of Policy and Civil Justice: in the year 1774, however, this was transferred to the eastern point of land at the river mouth where the new site received the name of Stabroek, and is now called Georgetown. Beyond the islands the plantations have now disappeared, their place being at present taken by the small settlements of coloured people and negroes, of which latter, after the Emancipation, a number banded themselves together, bought an abandoned estate or an area of Crown Land, parcelled it out, and so called a regular negro colony into existence. But as the black man always plants or keeps cultivated only just so much land as he and his family require for their support, the bank is already becoming regularly encroached upon by the wall-like forest against which the small white-painted residences, shaded with luxuriant coconut palms and plantains, stand out in pleasant contrast. The coconut palm shews to best advantage only so far as the salt water is carried up with the flood tide: beyond this limit the beautiful palm loses its fulness and develops a sickly appearance that becomes more apparent in proportion with its distance from the coast. On the Demerara this fact revealed itself to me most strikingly—the reason for its luxuriant growth might therefore lie in the evaporation of the sea-water or in the peculiar soil, which consists almost generally of a bluish clay mixed with disintegrated vegetable matter and copiously soaked with salt water. How much it must be dependent on soil and locality can be seen in our palm-houses, where one very rarely finds them, and then only in a sickly condition.

974. After passing the mouth of the Madewini, which flows into the Demerara from the East, there rose in front of us a huge building, on a fair way to complete ruin. It was the last property of an immensely

wealthy planter, Mr. Brandes.* His passion for hunting and his dissipations had lost him one estate after another, until nothing more remained left to him but this house. A short time before he had married the daughter of an Arawak and had moved to the home of his father-in-law on the upper Madewini. A number of hunting stories about him are current in the colony: one of them must be common enough about his having swapped two slaves for a good hunting dog. Two miles above the mouth of the Madewini, there rolls into the main stream on its western shore the Cammoni, one of its largest tributaries: in its course it receives the Waratilla into which the Mibero flows. The banks were occupied by some Arawaks. On the Cammoni are found several large sugar-estate on the Demerara—Plantation Glasgow: this, however, is timber establishments, but at its mouth rise the buildings of the last on the verge of being abandoned. A mile above the mouth of the Cammoni on the eastern bank there falls into the Demerara the Hawerorini which during its course receives the Timiti, Marinaje and Kororoni.

975. Hitherto, the river had followed its course through a flat alluvial plain: except where the thick woodland had made it impossible, no rising ground had prevented the glance from rambling over a 20-mile broad expanse. Now for the first time, just as we came round a bend, there rose a 70 ft. high elevation on the western bank directly on the water's edge, and with it we reached the chain of hills that the Colonists have named "The Sandhills." This stretches from the Arabian Coast to the Corentyn in a south-easterly by southerly and then in an entirely southerly direction, across the entire coast at the most varying distance from the sea-shore: for while along the Arabian Coast it approaches to within 2 miles of the Atlantic, it recedes some 40 miles farther back on the Berbice and Corentyn. Just as variable as its distance from the coast is its height at isolated spots, from between 50 and 120 feet: a second group of isolated hills parallel with these sandhills crosses the Essequibo at Osterbecke Point, in 6° 15′ lat. N., the Demerara at Arobeya in 6° 5′ lat. N., but the Berbice in 5° lat. N. The slope of the hill towards the river, with its dazzling white sand, looked as if it were covered with snow: its summit was covered with luxuriant woodland. (Sec. 1013.)

976. The owner of the hill, as well as of the whole of the land at the back, is a Mr. Brotherson, who formerly carried on an extensive timber business. Being already known to me, he gave me a hearty welcome at his pleasant little house that embellishes the top of the hill, where I gladly accepted his invitation to spend a few days: the markedly changed conditions of soil led me to surmise that I should reap a harvest of another kind of flora there.

977. This part of the Sandhills is at the same time one of the most favourite resorts for excursionists from Georgetown, and with the exception of the aristocracy the steamer almost every Saturday evening

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* There is a place in Madewini now known as Tubman's Hill, but which I have heard called Brandes Hill. (V.R.)

comes along with whole troops of pleasure-seekers. These bring their food and drink along with them; enjoy themselves during the night and morning with sport and dancing, and return on the Sunday to town. It is a motley do-as-you-please sort of crowd composed of Europeans, coloured people, Negroes, shopkeepers, artisans, officers and day-labourers, which however very generally ends up with the most serious fights if Negroes are present, because without a row a black man cannot live, or at least cannot enjoy himself.

978. I was indeed not a little surprised when, during the course of my first trip over these sandhills I once again found the lichens of the Roraima and Humirida Ranges: *Cladonia rangifera, coccinea, cocomia* and *carnea* had apparently overrun the flats, bare of forest, of this range of hills.

979. The rank forest which covered the hills consisted for the most part of *Laurus, Ficus, Anona, Eperua, Parivoa* and isolated trees of the beautiful *Alexandra Imperatricis*[*] Schomb., which my brother discovered between the 5th and 6th degrees of latitude, on the tributaries of the Cuyuni, but chiefly on the banks of the Wenamu, and named in honour of the Empress of Russia. The tree is conspicuous not only for its beautiful conformation, but for its lovely flower-bunches. Although the flowering time was over, its mostly 18 to 20 in. long brown pods, with their velvety surfaces, lent it an equally beautiful finery. The buds burst direct from the bark of the branches, as with *Theobroma* and *Crescentia*. The trees that I found on the sandhills were generally from 100 to 110 feet high. For the botanist, the interest in the tree is still further increased by the fact that it forms a link in the chain that binds together the *Papilionaceae* with the *Caesalpineae*, the two great divisions of the *Leguminosae*.[†]

980. About three miles aback from the bank of the Demerara runs a sandy flat of varying breadth which is covered by a thin low brushwood with isolated trees now and again in between. It runs moderately parallel with the Sandhills and has received the name of "savannah" by the Colonists although it bears not the least resemblance: in fact, the vegetation of this sandy steppe is one completely different, though at the same time many of the genera and species of the orchids found in British Guiana are present.[‡] The top surface of the whole terrain is covered with a loose white sand so that at first sight the entire area seems to have just as barren an appearance as the real tract of dunes

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[*] The technical description of this new genus, etc., in Latin, is omitted. (Ed.)

[†] Cf. "Die Barbacenia Alexandrinæ und Barbacenia Imperatricis" by Rob. H. Schomburgk, etc. Brunswick. Vieweg and Son.

[‡] Of the genus Maxillaria I found particularly: *M. Batemanni, M. chlorantha, M. porrecta M. pumila, M. unciata, M. sinuosa* and *M. Steelii*: of the genus *Epidendrum, E. smaragdinum* Bot. Reg., *E. longicolle* Lindl., *E minimum* Aubl., *E. pictum* Bot. Reg., *E. chloroleucum* Hook., and *E. coriaceum* Park: then *Pleurothallis picta* Lindl., *P. ciliata* Knowl., and the beautiful rare *Burlingtonia candida* Lindl., which I met with nowhere else. Here it is to be seen in large quantity hanging to the twigs of the bushes: its often 1½ ft. long white sweet-scented flower-clusters constitute the greatest ornament of this peculiar flora. Besides these, there are considerable quantities of the genera *Oncidium, Peristeria, Rodriguezia, Bifrenaria, Fernandezia, Zygopetalum, Dichaea* and several beautiful ground orchids. I also came across the lovely flowering *Commianthus Schomburgkii* Benth here.

along the coast, while the vegetation, if less rank, yet still of vigorous growth, must appear all the more wonderful to everybody. If however this arenaceous flat is dug into, one finds at a certain depth a sandy layer mixed with rich vegetable mould that constitutes the real support of the plant life. This sandy terrain possesses an exclusively peculiar flora which is besides remarkable for the perfume of its blossoms and their leathery foliage. The Indians call such tracts Moro (or Muri): they form the transition from the forest to the open savannah extending between the Demerara and the Corentyn.

981. The fauna of the Sandhills, of which I will only mention the most interesting representatives, was just as rich as the flora. During the months of December, January and March the ripe fruit of the many kinds of *Ficus* and *Brosimum* attracts the most brilliant species of small feathered folk. I found the barbet (*Bucco tenebrosus* Sw.) particularly plentiful along this area. Quiet and immovable, several of them perch on the dry branches of a tree-top whence they can overlook the whole district and often rise from time to time straight up into the air, to catch the insect that is drawing near, and then immediately return to their original post. The bird seems fond of perching high: its flight is wavy. It is said to nest in excavations in the banks and to live only on insects. *B. tenebrosus* is rarely seen in the depths of the forest, but most frequently where the virgin woodland alternates with clear spaces. The sprightly little manakin (*Pipra Manacus* Linn.) also proved of interest, its beard-like white feathers on the neck giving the bird a strange appearance: the characters of the whole genus are similar to our tits. Amongst the genus *Trogon* I may note *T. melanopterus* Sw., *T. melanurus* Gould, and *T. caligatus* Gould: *Tanagra* and *Nectarinia* were just as frequently met with. Equally plentiful were the *Kolibris* of which I found *Trochilus pella* and *auritus* Gm. especially on the small forest streams: the latter was only present in the very heart of the woodlands. Still more numerous were the pretty pigeons (*Columba passerina* and *Talpacoti* Temm.) on the forestless slopes: of a morning and after sunset one hears the peculiarly sad monotonous note of the male and female sounding in all directions. These pretty birds are less shy, and both species are only to be seen in open spaces. During the breeding season they keep together in pairs: subsequently, one finds them generally in small flocks. On the "Sandhills" I often discovered their nest built of little roots and grass-blades in and amongst *Clusia* and other thick bush: they likewise only lay two white eggs. The *Columba jamaicensis* Temm. and the magnificent large *C. speciosa* are just as plentiful. The former lives only in the dense forest, where it searches on the ground for its food; its note also has a uniform soft tone; its nest is likewise built in high bushes; and I have always only met with it singly. The *C. speciosa*, like the *C. rufina* Temm., also very common here, lives in pairs only during the breeding season: it subsequently collects in considerable flocks. Both species are very shy and always stick to the highest trees where one sees them frequently perched, especially on the dried branches: their nest does not differ in structure from that of the other kinds. *Thamnophilus naevius* and *T. doliatus* were just as scarce here

as in the *Avicennia* bushes of the coast. I found the pretty *Jodopleura pipra* in Mr. Brotherson's lovely collection of stuffed birds: this skilled huntsman assured me that this bird always comes at the same time with the *Ampelis* and also goes with it. The large swallow (*Hirundo collaris* Pr. Neuw.) is likewise present as a migratory bird and I succeeded in shooting a specimen: I have come across three flights of them during the course of my travels. The first I noticed in June, 1841, scattered on the surface of the water at Arapiacro and Tapacuma flying swiftly after insects. In April, 1843, they appeared in large crowds in the savannah around Pirara where they were flying hither and thither as quick as thought now high, now low, over the extensive plain: but they only remained for half a day. The third flight I also witnessed on the Demerara. I doubt whether they nest in Guiana. The genus *Dasypus* seemed to be the most numerous among the mammals and of the species present in Guiana three are found on the Sandhills alone: *Dasypus Peba* Desm. (Iessy of the Arawaks), *D. minutus* Desm. (Iessy Barakatta of the Arawaks), and *D. tatouay* Desm. They live in holes and generally cast 8 to 9 young, with closed eyelids at birth, but after that they soon follow their mother about everywhere. In spite of the coat of mail, the *Dasypus* can get along remarkably quickly, and it is only when they can neither dig into the ground nor manage to escape from their pursuer in any other way, that they will roll up and allow themselves to be caught. *Dasypus encoubert* Desm. is said to occupy specially the savannah between the Berbice and the Demerara. I also often came across the pretty little squirrel (*Sciurus aestuans* Linn.) whence it would seem that it is distributed over the whole of South America: in its manner of living it is quite like the European and, judging from the statements of the Indians, it must also build a nest for its young.

982. At the foot of the Sandhills and stretching from Mr. Brotherson's residence in a northwesterly direction was a regular forest of *Manicaria saccifera*, where large numbers of *Coelogenys* and *Dasyprocta* had chosen their quarters. Hunting for the former was very like our badger hunting. An old buckeen took the place of a huntsman in my host's household and hardly a day passed that she did not supply the table with a tasty piece of game. Accompanied by two dogs, which she loved like her own children if she had had any, with bow and arrow in hand, she hastened almost every morning to the forest, and had she only been a bit more young, and a little less ugly I might already have believed that it was with Diana whom I proposed trying my luck in hunting the creatures above-mentioned. Fortune did not smile at all favourably on us at first, the keen dogs scouring the truli swamp in vain, but when at last one of them was heard barking some distance off, our pack of loudly yelping hounds followed on. Shouting "Laba, laba!" my companion hurried ahead, and I after her, until we finally came up with them in front of a huge hollow overturned tree. On getting near, one of the dogs crept into the trunk and just as the impetuous huntress was making me to understand that the game would soon be out and that I must be ready to shoot, the laba made a bolt for it, and with the yelping pack at its heels sought safety in the speediest

flight. We quickly started on the chase again until the renewed barking of a dog indicated that the hunted creature was set. On this occasion likewise we found the hound in front of an overturned hollow tree into which the game had made its escape. So as not to let the frightened animal get away a second time the prudent huntress stopped the hole into which one of the dogs had followed. By the latter's barking in the tree-trunk we could tell the exact spot where the laba was, and our cutting down onto it with an axe seemed to inspire its yelp all the more furiously. After an hour or two the bottom was reached, the daring woman inserted her arm to drag the game out but suddenly burst into loud laughter and assured me that instead of a laba, there was a big armadillo in the tree. The dogs had probably lost the tracks of the former and struck the scent of the latter.

983. When effecting its escape the laba tries if possible to make for water so as to get away by diving, but however good a swimmer and diver it may be, it must come up to the surface at intervals to breathe, when it is easily shot.

984. On a subsequent excursion with the brown-skinned Diana up the Haiama Creek, that falls into the Demerara above the "Sandhills," she drew my own and Smith's attention to a peculiar movement in the water, and told us that a labaria was just then "fishing" here. At first I was unable to distinguish the snake under the water, but I really soon saw something like one that was on the prey: for it now dived as quick as thought to the bottom and again appeared nearer the surface, and swam at first slowly, than more quickly in all directions round about the area and finally crept on to the bank where I killed it. It was the very dangerous ground adder (*Trigonocephalus atrox*). My companion's statement was confirmed, because on opening it up I found two finger-long fish in its stomach. It is common knowledge that almost all snakes swim very well, but that poisonous ones should also hunt in the water for their food was new to me and seemed to be not generally known. The clayey banks of the Haiama were specially rich in infusoria.

985. Beyond the Sandhills the wild cashew (*Anacardium rhinocarpus* DeC.), as the Colonists call it, appears especially plentiful in among the forest trees. It is one of the hugest trees of Guiana, and in that respect differs essentially from *Anacardium occidentale*: its fruits have the same construction and taste, but are somewhat smaller and ruddier than those of the latter. Dr. Hancock notes that he has made use of the bark with success in cancer and other cancerous ulcers. The fruits are just as eagerly sought by human beings as they are by animals: the Indians make an intoxicating drink of it. From what my female companion told me, the tapir and monkeys eat ever so plentifully of them when ripe that they get quite drunk and then fall an easy prey to the hunters. The spirit distilled from it even exceeds rum and arak in strength, and on this account is generally preferred for the preparation of punch. Cashew wine and spirit are used in the Colony as diuretics.

986. Among insects on the Sandhills I particularly found several species of the prettily spotted but at the same time very dangerous

Mutilla to which the Indians, like the Colonists, have given the distinguishing name of "Tiger-ant." Like the terrible *Ponera clavata* they also only appear singly.

987. After an 8 days' stay with Mr. Brotherson, we resumed our journey up the Demerara. Its breadth had already diminished a good deal, and although the water had lost its salty tang, the action of the tide was very patent, because its fall and rise still amounted to 12 to 16 feet.* Opposite the Sandhills lies the abandoned plantation of Sans Souci, of which all traces of its previous cultivation are already lost: a thick underwood now covers the fields where sugar-cane flourished but a few years ago. On the left bank the small Turabano creek and on the right bank, just opposite, the Kuliserabo pour their waters into the Demerara:—immediately above the mouth of the former the terrain at the waterside rises to a height of 60 feet. Here, as is the case further up, some coloured people and negroes have settled on the abandoned estates Berlin and the Loo.

988. That elegant orchid, *Jonopsis teres* Lindl., flourished in immense quantity and rank profusion on the dense waterside, in between the large leaves of which its light violet blossoms made a beautiful show. I had never yet found it so plentiful as I did here. Just as strange a botanical phenomenon is the presence on the Demerara of the *Monachanthus longifolius* Lindl. which, like the *Vanilla palmarum*, is found only on the trunks of the ité palms (*Mauritia flexuosa*): its narrow dependent leaves often reach a length of from 6 to 7 feet. I found them only on the Demerara: my brother got them on the Berbice.

989. Beyond the abandoned estates Berlin and the Loo the dwellings of the negroes and coloured people became more and more scarce: thick virgin forest borders both banks, and it is only here and there that one strikes against a few acres of cleared ground which serves as pasture for the cattle belonging to the Negroes, coloured people, and timber getters living in these isolated spots, and for the cultivation of the vegetables required in their households. Timbered rises, 80 to 200 feet high, alternating again and again with flat tracts of land, occupied by Arawaks, stretch along the western bank.

990. One of the chief complaints of the Colonists is the so-called "squatting," *i.e.*, the arbitrary occupation by Negroes of uncultivated private or Crown lands. In spite of the many penal laws the practice has not been stopped but has rather increased so much within recent years, that the object of free immigration for the estates' owners has become quite defeated. In British Guiana, the Demerara is the main headquarters of the "squatters," who even here carry on an extensive timber-trade. The laws intended to put down vagrancy and squatting have been able to suppress neither the one nor the other: the only thing one can perhaps manage to do is to force the Negro to pay a ground-rent. The trees felled by the squatters are, already in the forest, roughly hewn into timber: during my stay in Georgetown several hundred dollars' worth of timber thus illegally obtained were confiscated from a black

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* These numbers are evidently a mistake. (Ed.)

It is the Demerara at all events, with its very large number of yards, that supplies Georgetown not only with the timber for construction purposes, but also with the firewood required in the household. Owing to the immediate environs of the city not possessing any forests, and communication with it by vehicular traffic not being feasible, firewood forms an important article of trade which is carried on exclusively by the Negroes: on account of their weight the timbers cannot be brought down the river in rafts, but in large punts.

991. The owner of a timber-yard where we spent the night, had a tame tapir, apparently full-grown, that strolled about as it pleased, spent the day in the forest, and at night-fall returned to its master.

992. On continuing our journey next morning we saw two coloured men in front of their house busily engaged in skinning a puma that had been killed the night before. It was the largest specimen I had as yet seen, but in order to get hold of the canine teeth the whole head had been unfortunately damaged.

993. At nightfall we landed at what was once an extensive wood establishment with a saw-mill, that could be driven both by steam as well as by water-power, where the owner, a Negro, gave us a friendly welcome.* On account of the small working capital the mill had completely gone to ruin and remained unused. Here again the rise and fall of the tide still amounted to 8 to 10 feet. In the course of the day we passed the mouths of a number of creeks, thus on the left bank those of the Yaruni and Tenbou, on the right bank those of the Caieruni† and Oritaja.

994. Although from now on the width of the river continued to diminish, its banks proved more and more interesting with every stroke of the paddle: this was due in large measure to the series of hills on its western bank which in some places they were in direct contact with, while in others they only joined it at a gentle slope.

995. Amsterdam with its houses on the left or western shore, formerly a plantation, now a small negro settlement, bore a pleasant aspect from in among the rank foliage. The terrain rose again to 200 feet. A few miles beyond, close in shore on our right, was a small rise 80 feet in height that bore the name Golden Hill, the top of which was capped with an Arawak settlement: at its base a small forest creek opens into the main stream. During the course of the day we passed, on the left bank, the mouths of the small creeks Camequear and Arobeya.

996. The site of the settlement was so inviting that I proposed spending a few days here where my wishes were just as friendly reciprocated by the residents. That the proximity to the city had not failed to exert its influence was evident as soon as I entered, because men as well as women wore clothes, yes, even the children, at least the little boys and girls did so too. In spite of these visible signs of civilisation the Piai of the place, during the night, carried on his nefarious business with a sick woman. I was thus afforded the opportunity of learning many a thing more about this dangerous personality and his power which up

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* This was probably Nerva.—V.R.

† The present Kairuni or Elizabeth Creek.—V.R.

till now had been intentionally or unintentionally kept hidden from me —perhaps also because they were special superstitions which the Arawaks alone believe in.

997. If one of his patients dies, it is only the piai who knows whether the sick person has met his death through the influence of an evil spirit or by the poison of another Indian. It is always upon the answer to this question that the life and death of another Indian will depend. If the evil spirit was the cause of death the body will be buried with the ceremonial already known. If the verdict be that he was struck down as the victim of some injury, etc., the corpse is carefully examined and should only a black spot or something otherwise unusual be discovered, the piai points this out as the place where the deceased was wounded with the invisible poisoned arrow. To discover the murderer, often the victim of the piai's personal revenge, he now proceeds to adopt the measures of which I was a witness at Waraputa with the only difference, that in place of the cut-off limbs of the deceased, he throws in the leaves from a certain tree: the culprit will be found on the side upon which the first leaf is thrown out over the edge by the bubbling water. The piai now gives a more detailed description of him, and if anyone, be it man, woman or child, has incurred his hatred, or if he himself perhaps lusts for the woman of another Indian, the one or the other will be charged with the death.

998. A member of the house of mourning now starts off as a Kanaima. If he happens to meet with the Indian indicated in some out of the way place all alone, he tries to shoot him in the back with a poisoned arrow: if he kills him on the spot, he straightway buries him without going deep, exactly where he falls. On the third night the kanaima returns, and drives a pointed stick into the grave and body of his victim: if on pulling this out there is blood on it, he licks it off, when all danger of any reprisals is removed and he can make his way back content to his settlement.

999. If the injury be not immediately fatal, and the victim still retains sufficient strength to get home, he begs his relatives to bury him secretly in some out-of-the-way place where his grave cannot be found by anyone: the Arawak is firmly convinced that, if the kanaima cannot on the third day lick up his blood, he (the kanaima) will go mad and die mad. If the piai accuses a woman or child of the outrage, the kanaima employs no poisoned arrow, but the poison-fangs of a snake as already mentioned: he throws his victim to the ground, and with the tooth slits her tongue, which, before the victim can reach home, is so swollen that speech is already lost and the murderer cannot be named.

1,000. I must mention here yet another peculiar idea with regard to the spiritual residence of people deceased. If an Arawak shows himself cowardly or faint-hearted at any business, or should it happen that, though a strong drinker, he nevertheless now and again succumbs to the influence of drink, he is called a Maggulurugua, a man without sense: if on the other hand he is of blameless conduct, and has remained a stranger to that weakness, he is a Gaggulurugua, a brave man. When such a Magguburugua dies, his spirit wanders around for ever in an uninhabited abandoned and infertile district, but that of the Gagguburugua lives in the air above its former village and quarters.

1,001. I was interested in noticing that the Arawaks prepare a salt from the Weyra (different species of *Podostemeae*). They boil this water-plant in water with the result that a crystalline salty brown sediment is deposited, which they use as a substitute for the real article.

1,002. Here again somewhere about a mile from the settlement a sandy flat with low isolated bush extended in between the mighty forest. The flora corresponded entirely with that of the Sandhills, upon which the glorious *Burlingtonia candida,* but on the small creeks in the environs of Golden Hill the pretty *Huntleya sessiliflora* Batem. were present in considerable quantity. On my first excursion with an Indian companion we were following a small pad in the forest when all of a sudden right in front of us a marsupial (*Didelphys*), the Yawari of the Arawaks, crossed it as hard as it could go, closely followed by a big snake which I at once recognised as the terrible bush-master (*Lachesis rhombeata*). The whole scene took me so by surprise that I forgot all about discharging my weapon at the 8 to 10 feet long reptile. As the forest was free from all undergrowth, we had an unobstructed view of the pursuit. Exhausted, scared to death, and probably already chased for some considerable time, the yawari climbed up an old stump where it remained squatting as if bewitched and stared at its pursuer that had caught up with it: the snake rolled itself in a spiral out of which it raised its head higher and higher and, as if conscious of the impossibility of its prey escaping, slowly prepared for a deadly spring. Had I met both the animals in this situation, I should have believed in the marvellous fascination which poisonous snakes are alleged to exercise upon their victims. The poor marsupial had won my complete sympathy, and in spite of the entreaties and warning of the Indian, who when he saw I proposed making the attempt, took to his heels, I sneaked up to within twenty paces of the two animals, and gave the snake the contents of both barrels. As the smoke cleared, my eyes sought the yawari in vain, for the stump was clear: the snake, however, taking some short circular turns, was squirming so convulsively amidst the fallen foliage that leaves and sticks flew high into the air and, as it had not been mortally shot, made its escape. While about to reload my gun it occurred to me for the first time that my Indian who had just cleared out had the hunting pouch and ammunition with him. After shouting a long while he finally answered me from the far distance, and so a considerable time elapsed before he was again at my side. I could not prevail upon him to help me search for the wounded brute, the tracks of which were now lost, and it was too dangerous for me to look for it by myself, however keen I might have been to secure such an unusually large specimen for my collection.

1,003. The environs of Golden Hill were generally fairly rich in snakes: I found three species of the genus *Dipsas* alone, *D. leucocephala* Schl. which is considered especially poisonous, *D. Weigelii* Fitz. and *D. pavonina* Cuv.

1,004. Amongst mammals the strange hedgehog *Echinomys hispidus* Geoffr. seems most plentiful, especially in the neighbourhood of the small forest streams. It appears to reside upon the trees: at least I have never come across it on the ground. In climbing and springing from branch to branch it can vie with the smartest squirrel. The female drops 4 young in the hollow limb of a tree, and these soon follow at their mother's heels: they constitute a special dainty for the Indians. It seems to be spread all over British Guiana, because I at least found it everywhere, while the distribution of *Loncheres chrysurus* Licht. is limited to definite localities, most frequently to the sources of the Corentyn. A tame porcupine *Cercolabes prehensilis* that one of the residents possessed, and which I bought, amused me much: unfortunately I did not possess it for long, because it ran away. The quills of this peculiar creature, which also only lives upon trees, are used by the Indians as necklaces and other decorations. A second species, the Cuyi (*C. insidiosa*) is also present here.

1,005. In the environs of Golden Hill the residents had set some remarkably peculiar traps for catching the smaller mammals such as *Coelogenys*, *Dasyprocta*, *Dasypus*, etc. The virgin forest which in the neighbourhood of the settlement was quite free from undergrowth, was intersected by a long stretch of a 2 to 3 foot high wattled fence. At every 50 to 60 paces were to be met openings in which, by means of a small supporting board, heavy logs are held a little above the ground. As soon as one of the animals specified is blocked by the fence in the course of its run it hurries along it, discovers one of the openings and, while creeping through, pushes up against one of the supports, when the log falls and kills it. Owing to these traps these animals have already become comparatively scarce in the neighbourhood. These were the first traps for mammals that I had noticed among the Indians, and I have no doubt that they were adapted from the Negroes who in this respect possess a good deal of ingenuity. Prince von Neuwied mentions similar traps in his Brazilian travels which he calls Fall-traps (*Schlag-fallen*).*

1,006. My ichthyological collection was also increased by two new specimens, of which the *Rhamphichthys rostratus* Müll. Trosch. was particularly common among the roots of the Caladium: the *Anodus cyprinoides* Müll. Trosch. was caught plentifully on the hook. After an eight days' stay I resumed my journey up the Demerara in company with 3 Arawak Indians. The river continued from the South. Between the thick and flourishing woodland of the banks there peeped out at us now and again the home of a timber-getter, a coloured man or a Negro, shaded as it was with *Musa* or orange-trees and hidden away among the lovely foliage. After passing on the right bank the mouths of the small creeks Arraqua and Watuka we reached on the left one of the most important and extensive timber-yards on the Demerara, known as

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*. These traps are still occasionally used by blacks, and perhaps by Indians, in the same neighbourhood. Their construction is detailed in Roth's "Arts, Crafts, and Customs, etc"—(Ed.)

Christianburg, the property of a merchant, Mr. Patterson. The large saw-mills were driven not only by water, for they are built quite close to a small ceek, but also by steam-power.

1,007. About two miles above Christianburg the course of the Demerara, hitherto rolling from the south, becomes altered. It now runs from the south-east, a course which it keeps for about two miles, when it comes from the south-west, then from the north-west, till it again runs out of the south, so as to form here the most important bend so far met with throughout its entire course. It is in this latter bend that, on the right bank, the 250 ft. high thickly wooded Kashwima Hills take their rise. Our attention was actively drawn to hundreds of carrion crows that were collected on the trees along the bank when an unpleasant stench soon struck upon our olfactory nerves, and the reason for this huge assembly was made clear. The statement of the Indians that it was probably the Wouraerepos (*Vultur papa*) that were stilling their hunger, and that the *Cathartes* were waiting for them to be satisfied, induced me to land, and to watch this peculiar phenomenon (probably for the last time.*

1,008. The nauseous stench soon led us to the spot where the carcass lay, upon which we now cautiously sneaked. Six of these beautiful birds, three males and three females, had just settled down to their fastidious meal. As soon as they noticed our presence they flew up with that peculiar noise which is produced when they rise, and settled upon one of the nearest trees where I managed to shoot down one of the males, but not mortally. The carcass which had attracted the crowd of birds was that of a tiger-cat, said to have met its death through some accident or other, my Indians maintained through snake-bite. Fortunately, the wounded bird must only just have come to eat: its crop was quite empty, and I could therefore take it alive into the boat, which indeed would have been impossible if it had been stuffed with its prey: the bird stank strongly like musk. I was consequently afforded the opportunity at the same time of admiring at close quarters the gloriously coloured skin of the bird's head and neck and of its beautiful eyes. Hardly had it been killed for skinning, hardly had the carcass started to get cold, than the gorgeous colours gradually began to fade, and on the following day not a trace of them was left. The shot had also scared the innumerable *Cathartes* which now in company with the King-Vultures swayed in a circle round the spot, and continued to rise higher and higher into the air. The feed however was too tempting to allow of their leaving the spot, for several of them, with drawn-in wings and the speed of a falling stone, suddenly rushed perpendicularly down from their heights. A peculiar noise was produced by this rapid vertical cut through the air, that sounded like the whistling of a flying bullet, and drew my attention to the strange manoeuvre. Just as the birds apparently got to the tops of the trees they suddenly altered their perpendicular course to an oblique one and settled on those in the neighbourhood of the carcass. The five vultures simultaneously executed this strange and very interesting movement which was also imitated by some of the *Cathartes*. The muscular strength of their wings is indeed worthy of admiration. Were a stone to be thrown from such a height, it might be a question which would reach the ground first, the bird or the stone.

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*. An exhaustive reply in a foot-note is here made to the published attack of von Tschudi in his "Fauna Peruana" part 7, p. 70, against Schomburgk's veracity. The attack is of course absolutely unwarrantable. (Ed.)

1,009. Another and formerly very extensive but now almost abandoned timber-yard is to be seen at Lucky Spot where the stream again comes out of the south. It is on the left bank, at a distance of about 75 miles, including river-bends, from Georgetown, and has a particular interest from the fact that in 1809 timber was loaded here by a 108-ton brig: a proof that the stream, even as far as this, is navigable for larger vessels. Above Lucky Spot the small Coreta Creek opens into the Demerara on its left bank. A few miles further the river almost exactly repeats its previous peculiar bends while the depth varies from 7 to 10 feet. On the left bank the land rises pretty well 180 feet and is covered with the rankest of vegetation. The glorious greenheart unquestionably constitutes the greatest ornament of the forest: with other species of *Laurus*, of which a large portion of the woodland covering the rise consists, it filled the entire atmosphere with the lovely aromatic fragrance of its blossoms. The temperature was almost unbearable to-day: we pitched our camp at the mouth of the Wainibisi which flows in on the right bank. While the Indians were busy cleaning up a place for us to sling our hammocks and cutting down the bush and rope-vines barring the way with their cutlasses, I noticed the previously-mentioned onion-like smell as strongly as if the people were working in an onion-field: on investigation I found it to be due to the stem and leaves of a liana (Sects 57,398) but which unfortunately shewed neither fruit nor blossoms just then. I have already drawn attention to the fact that not only the Hokko fowls (Powis) themselves, but also their flesh possess a peculiar onion-like smell and taste at certain definite times of the year: without doubt they must then be eating the fruits, seeds, or blossoms of this plant. Next night my attention was drawn to a greenish blue phosphorescent light which, as I discovered in the morning, streamed from a number of small fungi that were growing on decayed leaves and dried timber: unfortunately the specimens I collected were lost before they could be identified. Gardner in his Brazilian travels also mentions a strongly phosphorescent mushroom, *Agaricus Gardneri* Berk: it might be that the two are identical. A heavy storm with plenty of rain woke me out of my dreams and I spent an extremely unpleasant night, because we were without any protection from the rain. Morning had already dawned before we were on our way again, and on the left bank passed the mouth of the Hibbeba.

1,010. Now and again one of the large and pretty but shy herons, *Ardea Cocoi* Linn., would get a fright when, with retracted neck, and perched all by itself on the banks or upon a tree, it would stretch it out farther and farther as soon as it noticed us in the distance, and then, on our close approach, take to flight, uttering a peculiar rasping note as it did so. According to what the Indians say, this beautiful bird which is distributed over the whole of Guiana, nests on high trees. More numerous and less shy was a lovely dark-green glossy ibis, *Ibis nudifrons*, which it is not rare to find on the banks of the Demerara. One sees these beautiful birds always in pairs as they perch on the bared branches projecting over the water of trees that have fallen into it, or search on the banks for their food that may very well consist of insects and aquatic animals. When darkness begins to fall they rise into the air, and with their strangely guttural cry, make their way over the forest, probably to their resting-place. Prince von Neuwied mentions this peculiarity also with *Ibis sylvatica* Vieill.

1,011. Our attention was drawn to a huge creature swimming across the river about 200 paces ahead of us. In spite of the long distance we were away the Indians immediately recognised a jaguar by the curved tail towering above the surface. Although we increased our stroke, it managed to reach the bank before we could get within gun-shot, clambered up ashore onto an old tree-trunk that had fallen into the water, remained standing there to shake the water off its pelt, and then like a dog squatted on its hind-quarters and quietly watched our approach: it finally got up and slowly slunk away along the log and disappeared in the dense forest.

1,012. After passing the mouth of the Muritaro creek on the right bank we came to where, at some 70 miles from the coast as the crow flies, the first rocky boulders appeared in the bed of the Demerara, though they did not yet rise above the surface of the water.* The river also altered its course here: it comes now for 2 miles from an entirely westerly direction and then changes again to a southerly one, so that it apparently forms a right angle.

1,013. On the right bank we reached the former station, Post Seba, a word signifying Rock in the Arawak language, that had only recently been abandoned. Here, about 74 miles in a straight line from Georgetown, appeared the first masses of rock, a granite with plenty of hornblende, the rocky terrain rising some 60 to 80 feet above the level of the Demerara. Numbers of elegant lichens, especially *Usneaceae* and *Lecidineae* put life into the dead stone, in the clefts of which small *Piperaceae* and orchids flourished. From Seba a series of hills, also bearing the name of Sandhills, branches off to the S.E. As already mentioned it subsequently crosses the Berbice in 5° North lat. and continues in this direction up to the Corentyn. Its average height amounts to 50 to 60 feet. (Section 975.)

1,014. From Seba a path leads to the Berbice which one reaches on one of its tributaries, the Wieroni. The connection is through a creek on the latter which goes by the name of Caticaboora, where one embarks and then travels down it. The distance from Seba to Caticaboora creek, including bends on the path, amounts to about 50 miles. My brother took this track from Berbice to Demerara in 1836 on his journey up the latter.*

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*. It seems strange that the presence of the Watuka Rocks at Wismar should have escaped Schomburgk's notice. (V.R.)

1,015. About 4 miles above Seba, on the right bank, the Arissaraboo opens into the Demerara: the water of this stream is whitish. The direction we took continued a southerly one. The landscape view of our surroundings gained a great deal by the varying luxuriantly-timbered hills which, often reaching to the banks, gradually sloped down towards them, or else rose in tiers as in an amphitheatre: it continued to become still more surprising through the great multiplicity of greens in the dense foliage, and the alternation of innumerable blossoms, fruits and berries. On the left bank a hill of this description bore the name Tiger Hill. Thousands of small birds of the genera *Fringilla, Tanagrina,* and *Euphone* enlivened the trees on the banks as they flew from twig to twig and tree to tree, twittering away as they searched for food, when my attention was again forcibly drawn to a small group of pretty little *Midas* monkeys, wantonly funny as they skipped from bough to bough, and watched us from their Bellevue with their clever eyes as soon as we got in sight. On the banks we noticed plenty of "Fin-foot" birds, *Podoa surinamensis* Linn. We usually saw them sitting in the shade on bushes overhanging the water, or else swimming in it. If the bird is chased it flies from out of the water and settles again in the thick bush of the waterside: I have seldom seen it diving, which was only the case when it was wounded. Its note is peculiar. The Indians maintain that when danger threatens, the young hold on with their beaks under the wings of their parents. Prince von Neuwied has made the same observations. Above Tiger Hill the stream again comes from the west for a short stretch, and there where its course again runs from the south, the first rapids appear: they are called Kaikutschi.† They are situate about 85 miles in a straight line from Georgetown in 5° 37′ lat. N. and make a break in the hitherto smooth water-level. The tide exerts its influence up to here.‡ Above these yet insignificant rapids the small Kaikutschikabra creek, from which the rapids take their name, joins the Demerara on its left bank. Kaikutschi is, as already mentioned, the Indian name of *Champsa vallifrons* Natt., which abound in this creek in large numbers.

1,016. Two miles above Kaikutschi lies the almost abandoned timber-yard Vauxhall. It is the last European settlement on the Demerara. Above the mouth of the small stream Arampa, which opens onto the right bank, the land rises on both sides of the river: on the left it reaches a height of 200 feet in the Serribarra Hills with its culminating point in Itabou Hill, and on the right, one of 180 feet. The depth of the Demerara close to the mouth of the Camacabra and Hooboo amounted to 9 feet. Above the Camacabra a second path branches off to the Berbice, which is reached by means of the Ituni Creek.§

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*. See R. H. Schomburgk: Reisen in Guiana und am Orinoko p. 279.

†.— Like Waterton, Schomburgk evidently travelled up the Demerara River when it was in flood. There are two rapids (at Malali) below Kaikutschi-kabra not noticeable in flood-time. (V.R.)

‡.— only in very dry weather. (V.R.)

§.— and which is still used (V.R.)

1,017. We proceeded on without interruption in amongst a most vigorous and lovely floral growth of *Cassia, Melastoma, Dimorpha, Clusia* and *Vochysia,* while the less striking blossoms of the numerous *Laurineae* here met with, so characteristic of the vegetation of the Demerara, filled the atmosphere with their aromatic scent. We escaped the bad weather in the lonely hut of an old Negro couple with snow-white hair, who still managed to exist in this isolated spot, and whose miserable quarters afforded us a friendly night's lodging, as I was afraid of another stormy evening. The old people could not sufficiently thank me next morning when, resuming our journey, I left behind a present of rice, salt-fish, and a few drops of rum: long after the paddles had been started going, their voices still rang in my ears, "Good massa, good massa, long life to you!" A natural hollow among the thickly wooded hills, which now on both banks reached a height of 300 feet, enclosed the Demerara, and forced it at the same time into many a bend. Upon several of these hills and on their slopes one could still see traces and remains of former Indian settlements the occupants of which are now no more. The once cultivated stretches were demarcated sharply and distinctly from the high virgin forest, and presented a strange appearance, especially in the distance. The banks of the Demerara, once so numerously populated especially by Arawaks, have quite lost their red-brown population, some of whom have died out while others have taken up their quarters elsewhere: Golden Hill was the last Arawak settlement met with on its immediate waterside. A flock of parrots, in fact innumerable, that could be heard shrieking already at a quarter of an hour's distance, trooped over the river: they flew pretty low and settled upon the trees of the right bank which they apparently covered.

1,018. Several hills were the cause of the river veering round again for a few miles in a westerly direction, where it equally as suddenly makes a bend, so that here once more its course almost forms a right angle: it is in this bend that numerous rapids are met with.* On the other side of them, the path already mentioned leads to the Essequibo. Six or seven miles beyond this track I reached the end of my journey, the Oruru-Mallali or Great Fall of the Colonists, the position of which is 5° 19′ lat. N. and 58° 33′ long. W. In no respects did it make the mighty impression on me that I expected after what had been told me about its size: I had already seen many a more imposing spectacle. The height of the fall might amount to about 12 feet.† Farther navigation stops here because the channel beyond is suitable only for smaller corials. The upper course of the Demerara is known alone to the Indians, and from what they say, its sources lie in the Maccari, a small mountain system that approaches the Essequibo in 4° 28′ lat. N.: its channel runs in a general way fairly parallel with the Essequibo and Berbice, and although it receives a number of tributaries, none of them is of any importance. With a grand harvest, particularly of living orchids, I returned to Georgetown at the beginning of May.

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* The Kumaparu Rapids. (V.R.)

† The height of the fall is really 60 feet. (V.R.)

1,019. As my departure for Europe was deferred until the beginning of June, I made many a short excursion to the West and East Coast, about which I propose adding a few topographical and statistical notes. In the neighbourhood of the Essequibo mouth on the Arabian coast, are the two Negro villages, Queenstown, and not far from it, Catharinensburgh: the latter has a chapel. Frederiksburgh Village is on Wakenaam Island.

1,020. East of Georgetown, the "East Coast," undoubtedly the most fertile district of the whole seaboard, stretches for 25 miles to the mouth of the Mahaica. To supply the city of Georgetown at least to some extent with fresh water, a canal has been cut to the city at enormous expense from the Lamaha, close to its source, down to the sea: by means of sluices the rise of salt-water during flood-tide is prevented. Even if the water of the Lamaha Canal is not suitable for man to drink, it at least has its use for cattle and for washing purposes.

1,021. The portion of coast-line between the Essequibo and Demerara, the "West Coast," shews as already reported, a succession of the most productive sugar-estates which is only broken by the little village of Williamstown. This possesses a large roomy church, an apothecary's, and several shops: the villagers are mostly artisans of all colours, from negro to European.

1,022. On the East Coast, between the Demerara and Mahaica, are situate two villages, Buxton, and, a few miles from it, Victoria; they are still in their infancy. Victoria Village has come into existence from the fact that 63 emancipated negroes bought the abandoned plantation Northbrook for 10,000 dollars, parcelled out the lands, and established the village to which they gave the name of England's Queen.

1,023. On the western bank of the Mahaica lies the rapidly extending village of Mahaica, now Jonestown with something like 150 houses and 800 inhabitants: on its eastern side several houses have already been raised during the last few years, while a military post has been established lower down, at the mouth. Along the stretch of 25 miles between the Mahaica and Mahaiconi, are to be seen at the present time, as previously mentioned, a long succession of abandoned cotton-estates turned into pasture-lands. On the Mahaiconi and Abary, two insignificant streams flowing into the sea, lie the two villages of the same names, the latter in the course of formation: the former in earlier days included 50 houses, but as the big road from Georgetown to New Amsterdam leads through both places, it is only to be expected that Mahaiconi and Abary have already considerably increased by now.

1,024. On the Berbice, which falls into the Atlantic Ocean 57 miles east of Demerara, lies the second big city of the Colony, Berbice or New Amsterdam. Zeelandia, the first settlement of the Dutch on the Berbice, is 50 miles up the stream. The Colonial Government abandoned this spot, of little suitability for trade, in 1796 to lay the foundation of the new city a little above the mouth of the Canje River where a fort had already been erected in 1720. The city extends about 1½ miles along the bank of the Berbice, and is intersected by a number of trenches. For every house the builder received a quarter acre of land which he could make use of as he liked: this he surrounded with a trench that, emptied and irrigated by the ebb and flow, prevented the accumulation of filth. The favourable influence which this canalisation exercises on the sanitary condition of the town, is brought into prominence by the fact that Berbice is only very rarely attacked with yellow fever, and even when this does happen to be the case, never to the same extent as in Georgetown.*

1,025. From the sea there is a glorious view of the town. Crab Island, so called from the quantities of these animals found there, lies almost right in front of the mouth of the Berbice: it is low-lying, covered with bush and about a mile in circumference. A small dune running out from its northern and southern extremities divides the river bed into two navigable channels, but it is unfortunately increasing so alarmingly towards the eastern bank, that it is to be feared its extension will entirely block the deep canal with sand. On the eastern bank opposite Crab Island rise the ruins of the old Fort St. Andrew surrounded with four bastions and a wide ditch. The barracks of the military, and the quarters for the Engineers and Artillery are erected in a quadrangle surrounded by high palisades at the junction of the Canje with the Berbice and are also defended by a battery.

1,026. According to the Census of 1841, New Amsterdam had a population of 3,460, of whom only 180 were Europeans, the remainder consisting of mulattoes and Negroes. Amongst religious buildings might be mentioned the three churches of the Episcopalians, Scottish and Lutherans. The Wesleyans and Catholics already had chapels here when the city lacked her churches. Besides the Public School, which is supported by voluntary contributions and the substantial support of the Colonial Government, eight private schools are nevertheless in existence. The business portion of the city with its excellent warehouses and wharves built on piles runs immediately alongside the river. In addition to the overland post that constitutes the means of communication between both chief towns, there is also a steamer plying between them twice weekly, backwards and forwards.

1,027. The banks of the Berbice are occupied for about 40 miles up, beyond which the district of the aborigines commences. The sources must be somewhere in the neighbourhood of the third degree latitude north. At 3° 55′ lat. North it approaches the Essequibo to within 9 miles, and then strikes a north-westerly course, when its bed now narrows, and again forms lake-like expanses. The banks are also low and swampy: its cataracts and rapids begin in 4° 19′ lat. N. Up to 4° 50′ it is navigable, and at latitude 5° it winds towards the North-East, the direction which it retains as far as its mouth. The stretch of coast between the mouths of the Berbice and Corentyn is only here and there occupied by farms and sugar-estates which, equally scattered and isolated, also extend a few miles up the western bank of the Corentyn. The river empties itself in an estuary full of mud-flats and sandbanks between which are found several navigable channels. The width of this estuary between Plantations Mary's Hope and Nickeri, which passage is regarded as the real mouth of the river, amounts to 10 miles in a north-westerly to south-easterly direction. The distance between both banks of the bay between Gordon's Point and Plantation Alness amounts to 18 geographical miles. On the eastern bank of its mouth it receives the river Nickeri on which is situated the Dutch Fort Nickeri with a battery and garrison of 120 men.

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* This immunity from Yellow Fever is not to be attributed to the favourable influence of canalisation but to the distribution of the mosquito-carrier and to the fact that in a population of 3,460 there were only 180 Europeans. The author himself notes in another paragraph the comparative immunity of the native population. (F.G.R.)

1,028. The whole Colony is divided into 11 parishes: namely, Sts. Mary, Paul, George, Andrew, Matthew, Mark, Swithin, Luke, James, John, and Trinity.

1,029. On May 18th the members of the Boundary Expedition took their return passage to Europe in the steamer Trent. My rich botanical, zoological, geological and ethnographical collections, but especially my lavish collection of living palms, orchids and animals forced me to take a passage for myself and them on a merchant ship.

1,030. Among the letters waiting for me on my return to Georgetown from Pirara was one from home containing the information that a new zoological garden had been attached to the Scientific Institute of Berlin. I did not believe in letting the favourable opportunity slip of enriching it on my travels, and during my trip up the Pomeroon had already tried in every way to get hold of living animals with the result that I had collected a regular little menagerie, partly by barter and partly by purchase. The pride of my collection was one of those mighty eagles of South America, a *Harpyia destructor* Temm. This bird, so rare even in South America, had been brought by Indians from the interior to Georgetown, and had come into the hands of the Governor, who made a present of it to us on our departure: it was still fairly young and had a completely white plumage. As the Zoological Gardens at Regent's Park, London, did not even possess a specimen of these rare birds, I felt all the greater obligation towards the friendly giver. Besides a number of monkeys and other mammals and birds, such as *Crax, Penelope, Psophia*, Parrots, etc., I had also collected an *Iguana tuberculata*, several *Gymnotus electricus*, etc., and four of the larger snakes, viz:—an 11 ft. long *Boa constrictor*, two 8 ft. long *Boa murina* and a 6 ft. long *Coluber pœcilostoma* Pr. Neuw. The snakes I had already had for a long time: it was very surprising to me that these drank water very frequently and in large quantities, which none of the others did. I had the electric eels in large tubs, one of which was surrounded with iron hoops which, however, must have considerably weakened the electric powers of the creature, because I noticed its diminution in this specimen from the very first. Small live fish were their favourite food, which they generally digested quickly: as we threw them into the vessels they were shortly killed by the shock, and only then eaten. During the day the eels were always quiet, but with nightfall all the more restless. If we teased them continuously, so that they lost their electrical powers their colour changed to a violet, while several scattered black spots became distinctly visible on their bodies. The electric shocks were equally appreciated through the tubs, the result being that the sailors when carrying them to the ship let them twice fall My brother succeeded in bringing one of the biggest specimens as far as Southampton when, as the result of a shock, the tub when being taken out of the ship was dropped by the sailors and the fish met with its death Although I had brought numbers of earth-worms for their food, and a quantity of fresh water for a daily change, I did not manage to get my keen wish fulfilled: my two last living specimens died in the Channel. As I found soon after putting out to sea, that owing to the lurching of the ship, the belly of one of the specimens was galled by the wooden bottom, owing to which wound it probably died, I lined the remaining tubs with soft flannel: damage was thus guarded against, but death was not prevented. The leaves of the *Caladium arborescens* must be a non-conductor of its electrical energy, for which reason the mulattoes generally use them when they want to catch the fish.

1,031. The good ship "David Luckie" that would be leaving at the beginning of June was to bring me and my collections back to Europe. With the greatest care, I erected a frame in her "long-boat" for my palm and orchid collection which was enclosed and covered with a large oiled awning to protect them from the salt water. For the delicate orchids I got two "Ward" cases made: my means could not afford a larger number.

1,032. On the 4th June we left the mouth of the Demerara River. We had hardly lost sight of land when I was again attacked with that holy terror, sea-sickness, which kept me to my bunk for five days. The first stroll I took outside my cabin was to my nurselings: although these had not encountered a drop of sea water, a large number had already been destroyed by the pungent sea-air and many of my palms which a few days before were so healthy, hung down their fronds as slackly as if boiling water had been poured over them. To save those yet preserved from entire destruction I had all the boxes immediately brought down into the cabin where they could indeed be protected from the damaging influence of the sea-air but not from the teeth of the numbers of rats and mice. However welcome these fellow-passengers might be for my menagerie, I could have wished them at Jericho so far as my living plants were concerned. Out of 200 palms I unfortunately succeeded in bringing only some 60 to Berlin, but out of my grand orchid collection I luckily managed to save some 300 specimens covering 60 species. A really successful transport of palms can only be effected with the help of a Ward case: but where was I to get the money from, to have them made in Georgetown?

1,033. After an eight-weeks somewhat tiresome journey, for I was the only passenger on the ship on which, towards the end, I had to bewail almost daily the death of one of my menagerie, with the carcass of which I sustained the others, we landed in England, and I stood again on the shore of the big Ocean, and looked back upon the Past just as more than three years before I had stood on the opposite strand and with a heart full of hope had gazed into the Future. Many of these hopes had become sweet realities, many of them were shattered in the chilly atmosphere of my native land: a warmer climate had developed their germs: how could I expect them to thrive in a colder one?

THE END.

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